NOVEMBER 15, 1918.

WHOLE SERIES, VOL. XLII. No. 11. THIRD SERIES, VOL. XXXIV.

The THERAPEUTIC GAZETTE

INCORPORATING

MEDICINE AND THE MEDICAL AGE

A Monthly Journal of

Practical Therapeutics

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EDITORIAL OFFICE, N. W. Cor. 18th and Spruce Streets, PHILADELPHIA, PA.

SUBSCRIPTION RATES:

United States and Mexico, one year, ...	Two Dollars.
Canada, one year, ...	Two Dollars and Fifty Cents.
Foreign Countries (postage prepaid), one year, . . .	Ten Shillings.

E. G. SWIFT, Publisher, - - - DETROIT, MICHIGAN, U. S. A.

FOREIGN OFFICES:

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WALKERVILLE, ONT., CANADA. MONTREAL, QUE., CANADA—118 St. Paul St., W.
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DETROIT, MICHIGAN, U. S. A.

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EDITORIAL OFFICE, N. W. Cor. 18th and Spruce Sts., PHILADELPHIA, PA.

Editorial communications should be addressed to the Editors, N. W. Cor. 18th and Spruce Streets, Philadelphia, Pa. Articles intended for the Original Department will be accepted only with the understanding that they are contributed to this journal exclusively. Authors will receive reprints in pamphlet form, without charge, providing the request for them is written on the margin of the articles submitted.

SUBSCRIPTION RATES:

United States and Mexico, one year, - - - $2 00 | Canada, one year, - - - - - - - - $2 50

Foreign Countries (postage paid), one year, 10/-

Foreign subscriptions may be forwarded through

THE THERAPEUTIC GAZETTE, 19 and 20 Great Pulteney Street, W., London, Eng.

MR. H. K. LEWIS (Medical Publisher and Bookseller), Agent, 136 Gower Street, London, W. C.

THE THERAPEUTIC GAZETTE, 125 York Street, Sydney, N. S. W.

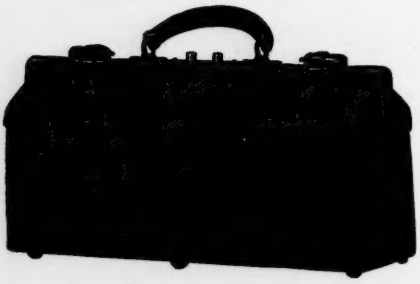
THE THERAPEUTIC GAZETTE, Walkerville, Ontario, Canada.

THE THERAPEUTIC GAZETTE, 378 St. Paul Street, Montreal, Canada.

Address all business communications to

The Therapeutic Gazette,

743-747 Atwater Street, East, (P. O. Box 484) **DETROIT, MICH., U. S. A.**



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MEDICINE AND THE MEDICAL AGE

Whole Series, Vol. XLII. DETROIT, MICH., NOVEMBER 15, 1918. Third Series, Vol. XXXIV, No. 11.

ORIGINAL COMMUNICATIONS.

CONCERNING ENUCLEATION OF DISEASED TONSILS—EVIDENCES OF ITS EFFICIENCY; PROBABLE ERRORS IN ARGUMENTS OF ITS CRITICS; MEASURES THAT FACILITATE ITS MOST PERFECT ACCOMPLISHMENT.

BY J. LESLIE DAVIS, PHILADELPHIA.

Notwithstanding the fact of my having been a rather frequent contributor to the literature upon the subject of tonsils, several recently published articles express conclusions, or at least opinions, so widely at variance with my own experience that I feel not only justified in presenting another paper upon the subject but that I would be neglectful of a duty if I refrained.

Since it is of importance, as affecting the value of deductions, I may state that during my experience in the treatment of ear, nose and throat diseases my opportunities for the study of tonsils have been extensive; that my earliest operative training was in the use of the guillotines, punches and snares for partial removal, the popular procedure of that period, which afforded evidence for later comparative study; that my own operations comprise a series of several thousand cases, all of which since September, 1907, have been enucleations; and that I have had no casualties nor serious complications during or following a tonsil operation.

Many of these tonsillectomies were for patients whose tonsils had been partially removed before the radical measure was generally recognized, but a larger percentage were of more recent disappointment, having been assured that their tonsils were completely removed, and some of them two and even three times, only to find that there still remained in their throats varying sized masses of tonsillar tissue, which in numerous instances had continued to exert practically the same evil influences as had their original tonsils.

Such *disappointments resulting from the unsuccessful accomplishment of attempted enucleations* I believe have formed the basis for a large number of perfectly conscientious assertions to the effect that the complete removal of tonsils has proved to be false in principle and that its consequences are commonly not only devoid of benefit but even accompanied by direful results. To point out possible fallacies in what I believe to be unjust conclusions, and to contribute evidence toward the establishment of such confidence as the principle undoubtedly merits will be the object of this communication, incomplete though it be. The brief space of fifteen years has witnessed an upheaval in theory and practice upon the subject of tonsils so wide-spread in its interest and so complete in its thoroughness that the existence today of markedly divergent opinions is to be expected; and while general interest is an acknowledged advantage for ultimate good, yet through popular enthusiasm there is no doubt that a desire to be abreast with the times has far too frequently led some

members of the profession to attempt measures for which they were poorly prepared. We must recall that prior to the past two decades it was a generally accepted principle that a tonsil operation, which consisted in the snipping off of a protruding portion of tonsil, was a simple, safe and beneficent procedure; that it demanded not the services of a surgeon nor subsequent attention, and was not an uncommon procedure, done with impunity, by the family physician in the varied routine of his office practice.

When the more radical procedure supplanted the minor one it unfortunately carried with it the old conception of being simple and trivial instead of being recognized as a major surgical operation, demanding not only every care, precaution and capability on the part of the operator and his assistants, such as would be required in any form of major surgery, but a specialized training as well.

The time limit, however, has long since expired for the charitable consideration of any one, whether he be regarded as specialist, near-specialist, surgeon, or occasional surgeon, who would dare undertake the removal of tonsils without conscientious recognition of the gravity of the operation and of his own qualifications for its satisfactory accomplishment.

The need is undoubtedly imperative and the time propitious for a frank summing up.

That faulty surgery is to-day the one most responsible factor for ninety-nine per cent of the disappointed patients who have undergone the tonsil operation, and for the same proportion of the medical critics who hold adverse views upon the principle of enucleation, I am absolutely convinced.

With equal conviction, then, that not only is the operation justified and desirable when efficiently performed, but that in competent hands uniformly perfect results will attend ninety-nine per cent of all cases, I shall pursue the further consideration of the subject for convenience sake under six subdivisions, each one of which, however, is a large subject in itself.

1. Every diseased tonsil, if not actively detrimental, is at least constantly a menace to the health of the individual. It is not my purpose, nor would it be desirable, to enumerate either individually or in classes the multitude of diseases, discomforts, and infirmities that have been traced to tonsils, for it has been amply substantiated both clinically and bacteriologically that from no other source within the human body are foci of infection so commonly active. We have long since learned that the classic indications for the surgical treatment of tonsils a few years ago, namely, "interference with respiration, deglutition, and speech," are by far their three least harmful as well as least common effects; that in the smaller, submerged varieties are the most virulent combinations of germs concealed; and that systemic disease due to intratonsillar activities usually bears no relation, either subjective or objective, to local manifestations in the tonsils themselves. One of the most frequent difficulties encountered is to convince a patient that certain constitutional disturbances of undoubted origin are due to diseased tonsils when they have never suffered from "sore throats."

Frequent and serious as are the tonsils as sources of infection, I am persuaded that their *toxic* effect is of even greater importance, though this characteristic seems not to have been given the attention that it deserves in the literature.

I stated in a paper on "Diseased Tonsils: Their Toxic, Infectious and Reflex Effects," read before the Laryngological Section of the last meeting of the A. M. A., that in my clinical observations for many years I had noted almost constant evidence of disturbed liver function in connection with diseased tonsils, varying in degree from a mild atony to marked inhibition, and cited as a typical case my own experience before and after the enucleation of my tonsils two years ago.

Through this effect varying degrees of intestinal toxemia are frequently brought about, general poisoning of the system develops, extra work is thrown upon the excretory organs, impeding elimination and bringing about a more or less constant state

of disturbed function of every organ, thus weakening resistance to disease of any nature.

I believe the majority of so-called bilious headaches can be traced to tonsillar-toxic-hepatic effect; that most colds in the head are developed in the same way, the congested nasal membrane from the toxemia preparing a favorable field for infection and the consequent prolongation of the cold or sinus infection.

Certain cases of appendicitis attributed to focal infection within the tonsils are likely the result of weakened resistance from the effect of tonsillar toxins upon the liver.

Many cases of cardiac arrhythmia, neuritis, thyroid enlargement, and various eczemas, herpes, and urticaria, are doubtless due primarily to the toxic element of diseased tonsils.

Subnormal blood-pressure frequently accompanies prolonged toxemia from this cause.

2. Proven inefficiency of conservative measures of treatment.

Since both the infective and toxic elements are harbored in the depths of the tonsillar crypts and tissues it is not surprising that either local applications or superficial surgical procedures fail to reach or to eradicate the seat of greatest pathologic activity. Not only have topical applications and gargles proven only locally palliative, exerting no effect on the systemic phases of absorption, but even the more radical of mild measures, slitting the crypts' ostia, curettement, aspiration, and irrigation, are in the majority of cases but temporizing, and not improbably may open up new avenues by which increased absorption is facilitated. Hence in the absence to-day of any milder measure that offers assurance of safety, the radical operation is the logical course of choice.

3. Fallacy of the oft-heard argument, "Why sacrifice an organ that must have been created for some purpose, even though we may not know its function?"

In the first place, if its removal resolved itself into a sacrifice, which it does not, the ground would be more tenable, since sacrifice, in the usual acceptation, means "loss incurred or suffered without return."

Every one will admit that tonsils, either during some age of the world's development or during some period of an individual's life, were or are appointed to some particular function. Just what that function was, or is, no theory yet advanced seems to be entirely satisfactory, but no man of reasonable judgment would think of invading its tissues nor of molesting its position, even were it definitely known that it was void of all function, provided it also remained void of offense.

This much, however, is sure, and to my own mind is sufficient to serve all practical purposes of decision for patient and physician, and I have been both, namely: Whatever might be Nature's intended function for tonsils, it is to-day either a non-essential function, regardless of the age of the individual, or else a function which is amply supplied vicariously from some other source, since following the tonsil's complete removal there is no detectable absence of, or interference with, any function of the human body necessary to perfect health and comfort.

Thus in the absence of other contraindications that might render the surgical procedure inadvisable for the patient, I deem the complete removal of every chronically diseased tonsil *competently accomplished* the most beneficent method of treatment, and in no sense a sacrifice.

4. Tonsillectomy contrasted with tonsillotomy.

I would not deny that a certain type of enlarged tonsil might be rendered in a measure less harmful by amputation of the protruding, obstructing portion, nor that the unaccustomed or unskilled operator could perform the latter with less danger to the patient than would attend his attempting an enucleation; but I do not believe that there exists any type or condition of tonsil, sufficiently diseased to justify any surgical course, that would not obtain more

perfect and permanent relief by complete removal. It cannot be shown that the retention of any part of a tonsil for functionating purposes is necessary, and it is a too well established fact that even a small remaining portion of a tonsil may prove as deleterious in its capacity to harbor bacteria and favor the development of putrefactive processes as did the original whole, to justify argument.

Some advocates of tonsillotomy, the partial removal of a tonsil, have claimed the need of the body of the tonsil between the pillars to prevent their lying in contact; or that the enucleation of the tonsil leaves an undesirable deep cavity in the side of the throat where food may accumulate.

Such opinions doubtless have been formed in an inadvertent oversight of the anatomic relations of the structures concerned. In the first instance the palato-pharyngeus muscle of the posterior pillar and the palato-glossus muscle of the anterior pillar have of course fixed origins and insertions independent of the tonsils, except for the attachment of the tonsillar capsule to the aponeurosis of the fossa surface of these muscles, which, where the tonsil is removed, resume their original normal positions of proximity at the palatal origin and the same degree of separation between the pharyneal and glossal terminations that existed in relation both to the normal and to the enlarged tonsil; or in other words, the insertional points remain the same distance apart whether there be an enlarged tonsil, normal tonsil, or no tonsil at all.

In the presence of normal tonsils both the anterior and posterior pillars bear a straight course between their origins and insertions; enlarged tonsils bulge the bellies of these muscles apart; and following tonsillectomy they resume their original direction with no tendency whatever to lie in contact, unless they become adherent from the ill-advised method of suturing the pillars together to control hemorrhage.

The same phenomena in regard to the superior constrictor muscle will explain why a permanent deep fossa does not result from tonsillectomy. The normal tonsil, being a shallow body between its inner surface and its outer capsular surface, simply lies in contact with the aponeurosis of the constrictor muscle without forcing or bulging it outward. When, through pathological changes, however, the tonsil becomes enlarged within the fossa, the belly of the constrictor is gradually forced outward, where it maintains a curved position in contact with the tonsil.

Following the perfect removal of the tonsil, this unnatural curve of the muscle gradually resumes its normal position, and the eventual result is not the deep fossa as at first observed, but a gently concave surface, which can neither favor the retention of foreign substances nor interfere with the most perfect use of the voice.

5. Dangers attending the operation and causes of their far too frequent occurrence.

That dangers have attended, and still attend in appalling numbers, the operation of tonsillectomy is unfortunately true; but that these dangers can be obviated and the operation rendered uniformly safe I am equally sure.

When within the past few months there have appeared in several prominent medical publications articles by prominent throat specialists, recounting serious complications and sequelæ as a common result of the complete removal of tonsils, it is highly important, regardless of any apparent superabundance of tonsillar literature, that those whose experiences have been entirely the opposite report their results and their methods.

I am sure that any one who has been disappointed in small or great measure with tonsillectomies will welcome information that may show wherein he may have erred in his own method, or in the application of any other, or that might disclose an error in his conclusions.

In the *Medical Review of Reviews* for April, 1918, under the title "Tonsillar Operations and Their Results," Dr. Seth Scott

Bishop condemns enucleation without reservation in his opening paragraphs:

"The voluminous literature on tonsillar operations during the last few years indicates the importance which physicians attach to the subject and their increasing interest in it.

"But there are two most surprising features which stand out prominently in that literature: first, the numerous disastrous results following tonsillectomy, or complete enucleation of the gland; and second, the persistency with which operators unnecessarily adhere to that method."

That numerous disastrous results following tonsillectomy is a prominent feature to be observed in the voluminous literature on the subject is unfortunately true, and if all the disasters resulting from attempts at enucleation by incompetent operators were added to those that have been reported it would doubtless be a far sadder commentary.

Some may reply that "every good surgeon was at one time inexperienced, or that a beginning has to be made by every one," which is perfectly true, but a major operation is a hazardous undertaking unless preceded by careful training.

Dr. Bishop further observes: "In looking over my notes on this subject for the year 1917, I found 32 cases of lung abscess reported by seven different writers, besides numerous other bronchopulmonary complications. One hospital memorandum declares that 20 per cent of all lung abscesses are post-tonsillectomy in origin. Another hospital reports that it is estimated that fully one-third of the pus infections of the lungs examined in the radiographic department of this hospital were secondary to tonsillectomy in narcosis."

This I believe is but another fallacy of blaming the operation for effects due to *avoidable imperfections in technique.*

A most instructive and significant series of discussions was published in the *Laryngoscope* for July, 1917, on "Lung Abscess following Tonsillectomy," Dr. Manges having reported a series of nine cases treated in Mount Sinai Hospital, the general opinion being that the most probable cause was aspiration of blood, tonsillar tissue or infected tonsillar exudate at time of operation; while Dr. C. W. Richardson, in a paper on the same subject in the *Annals of Otology* for December, 1917, states: "It seems to me that the method of invasion is either indirect, through the lymphatic or venous system from the wound surface, or direct, through the inspiration of pus or bacterially laden caseous material into the pulmonary tract."

Dr. Cornelius G. Coakley, discussing Dr. Manges's paper, after indorsing the aspiration theory as probably the sole cause, adds: "The operation of tonsillectomy if performed under general anesthesia should in my opinion have a trained corps of workers each doing his part of the work, just as in any other well-conducted surgical procedure."

In my own experience I have never known a lung abscess to follow tonsillectomy, nor do I believe there has developed a postoperative bronchitis in as many as one-half of one per cent of cases, which results I attribute wholly to the careful administration of the anesthetic, and a strict guard against the aspiration of blood or any tonsillar contents.

In age my patients have ranged from ten months to sixty-nine years, many of them between forty and sixty, while not less than one-third of them have been over twenty.

6. Points from my own practice as to the anesthetic, operation, and care of the patient.

Disclaiming any intention to infer that my own methods are in any wise superior to others whose results are uniformly satisfactory, I nevertheless deem it wise to refer to a few points in my technique, more complete reports of which were published in the *Pennsylvania Medical Journal* for November, 1911, and with illustrations in the *Laryngoscope* for March, 1914.

In every case, without existing contraindications, I employ general anesthesia, administered by a skilled anesthetist to the

point of abolition of the pharyngeal reflex. In the earlier years of my practice I operated not infrequently with local anesthesia, the patient's preference being the usual determining factor. Through careful analysis and comparison, however, I arrived at the conclusion that for both children and adults general anesthesia was preferable from three general standpoints: comfort to the patient, safety to the patient, and facility in the accomplishment of enucleation and ligation of possible sources of hemorrhage.

In the first place I believe, with the establishment of confidence in the patient's mind, a skilfully administered general anesthetic of nitrous oxide with oxygen followed by ether (preceded in adult cases by a hypodermic of morphine and atropine) is of less discomfort to the patient than any local anesthetic could possibly be. The mental attitude of the patient is a very important factor, and in this the patient's attending physician can be of great assistance in giving assurance beforehand.

One thing in particular that I think every physician should be extremely careful about is in saying to a patient, who has at the time of examination some contraindication, "Don't ever permit any one to give you an anesthetic," unless he is positive that the contraindication is a permanent one. I have found it necessary on several occasions to operate on patients who had been so instructed many years previously, and yet they got through without a complication or consequence other than their extreme mental anxiety from fear of "never waking up" because of the old warning that it could never be done.

In the second place, I regard general anesthesia safer than the injection of any local anesthetic into the tonsil, its fossa, or the surrounding tissue.

In none of my local cases did I have any complications, but I always believed the potentiality for trouble greater, having in mind the possibility of the needle carrying bacteria in passing through the tonsil and establishing new points of infection in the surrounding tissues, or else depositing it in the blood stream itself.

The occasionally mentioned dangers of cardiac or respiratory failure, bronchitis, pneumonia, or nephritis, following general anesthesia, I have never encountered, which I attribute to a capable anesthetist, the prevention of blood and tonsillar débris being aspirated, a calomel and saline laxative the day after each operation, and hospital care for not less than two or three days.

Lastly, by the method I employ, the operation itself is greatly facilitated, and the ligation of bleeding vessels more effectively accomplished under a general anesthetic.

The eversion of the tonsil, which is the first step toward enucleation, is much simpler when the surrounding muscles are relaxed; the walls of the fossæ are more easily retracted, and the base of the tongue more readily manipulated for the thorough inspection of the fossa throughout its extent, for in addition to the ligation of the "true tonsillar artery" (that enters the fossa superiorly) in every case, I also ligate any other occasional bleeding vessel that shows a possible tendency to persist.

To summarize briefly, I believe that all chronic diseased tonsils are capable of too varied and far-reaching detrimental effects, from an infectious and toxic standpoint, to justify their retention for the purpose of any mild or temporizing measures of treatment; that no surgical procedure short of complete enucleation will give perfect and permanent satisfaction; that the operation, performed under a capably administered nitrous-oxide-oxygen-ether anesthesia, can be uniformly accomplished with safety, with freedom from the complications of hemorrhage and pulmonary infections, and without affecting either the integrity of muscles or the quality of voice.

TONSIL OPERATIONS AND LOCAL ANESTHESIA.

BY S. MacCUEN SMITH, M.D.,
Professor of Otology in the Jefferson Medical College.

Concerning the question of the removal of tonsils and adenoids under local anesthesia, I almost uniformly remove tonsils under general anesthesia.

I was one of the first, I believe, to use a snare in the removal of tonsils, and in former years I removed them almost exclusively under local anesthesia. This practice I gradually abandoned, perhaps because my patients did not wish to be operated without the insurance against pain of a general anesthetic. Hence it will be seen that I am not prepared to enter into a discussion of the pros and cons in an authoritative way.

At a recent joint meeting of the American Otological and the American Laryngological, Rhinological and Otological Societies, held at Atlantic City, several of the men doing otolaryngological work at our cantonment institutions reported their success in the removal of tonsils under local anesthesia, and indeed some of them made the statement that they intended, when they returned to private practice again, to continue to perform tonsillectomies under local anesthesia. My own feeling is that they will find their *private* patients holding the same mental attitude toward undergoing operations under general anesthesia *after* the war that they did *before* it, in which case they will necessarily return to the use of general anesthesia in the performance of tonsillectomies.

REMOVAL OF TONSILS AND ADENOIDS UNDER LOCAL ANESTHESIA.

BY FIELDING O. LEWIS, M.D.,
Assistant Professor of Laryngology in the Jefferson Medical College.

In selected adult cases, local anesthesia affords a very simple and thorough method for tonsillectomy, with little discomfort to the patient. Schleich's solution or apothesine, ½ of 1 per cent, with one drop of adrenalin solution 1 to 1000 to each fluidrachm of the solution, is injected through the tonsil with a hypodermic needle of sufficient length to reach between the capsule and the muscle. Two or three injections in this manner I have found sufficient to render the field of operation absolutely painless. Following the injection of the anesthetic, the tonsil can be removed in a few seconds by the snare eversion method.

Following the removal of the tonsil, it has been my custom in cases in which the tonsillar fossa is of sufficient size to insert a small gauze sponge, which is left in position for four or five hours following the operation. This I believe helps to avoid the possibility of a postoperative hemorrhage.

By the term "selected cases for local anesthesia" I refer to those cases which have fairly tolerant throats and who are not highly neurotic. In my experience, postoperative hemorrhage has occurred more frequently under local anesthesia, and is often more difficult to control after the effect of the local anesthesia has worn off.

The period of convalescence is usually longer, and the patient apparently suffers more pain following the use of local anesthesia than under general anesthesia.

In those cases in which it is necessary to remove a portion of the lingual tonsil to prevent a possible recurrence of the tonsil, it is not so easy to render insensitive to pain the tissues at the base of the tongue.

Under general anesthesia hemorrhage can usually be conveniently stopped, and without the patient becoming panicky. In the records of cases of tonsillectomies there have been more deaths recorded un-

der local anesthesia than there have been under general ansthesia. There is always a possible danger under local anesthesia of an embolus being introduced by the use of the hypodermic syringe, or the solution being injected into the circulation through an anomalous vein.

Adenectomy under local anesthesia is very easily performed by injecting into the adenoid mass the same solution as is used in the tonsil operation, and subsequently removing the adenoids with a La Force adenotome equipped with a sharp blade.

THE CLINICAL ASPECTS OF HEMATURIA.[1]

BY CHARLES S. HIRSCH, M.D.,
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When a patient seeks relief because of the manifest presence of blood in the urine or at the urethral meatus, it is squarely up to the physician to find where that blood is coming from and what is its cause. While in some cases the origin and cause are obvious and simple, in others the finding of them constitutes an extremely difficult problem, and in order to make a thorough study it is necessary to understand all the various conditions of which hematuria is merely a symptom.

The etiologic vista of hematuria is a broad one, hence a résumé of all the factors involved may not be amiss. The patient is nearly always alarmed; therefore, to apply any hit-or-miss measures in diagnosis and treatment will more often miss than hit, as is so frequently the experience of physicians who either lose out with their patient or find at post-mortem how mistaken they were in their diagnosis. If the treatment is to be of any value the source of the hemorrhage must be ascertained; hence a complete cystoscopic and urethroscopic study is essential, plus the aid of the *x*-ray and the laboratory. Though repeated examinations may be necessary, the experienced urologist can with but few exceptions (which will be mentioned later) always give definite information.

When blood appears at the meatus during intervals of urination, the source of the hemorrhage is nearly always in front of the deep transverse perineal muscles, but to this there are some striking exceptions. When blood suddenly appears, at or toward the end of urination in a previously clear stream, it is reasonable to place its origin in the bladder, or close to the outlet within the prostatic urethra, or in the prostate, though at times in an apparently typical condition of this sort the urethroscope will disclose the blood coming altogether from points anterior to the membranous urethra.

When the anterior urethra is the source of hemorrhage, the cause is usually from trauma which may occur as the result of instrumentation or mechanical violence, or from stricture. The bleeding may be very profuse and persistent. The origin of the bleeding in these cases is obviously easy of detection. Rupture of the anterior urethra is fortunately a rare occurrence and is easily recognized. Soft infiltrations and exuberant granulations may bleed profusely, especially after instrumentation or excessive coitus.

If no blood is seen at the meatus we are certain that the lesion is at least posterior to the compressor urethræ muscle. This, of course, opens a vast field. By a careful process of exclusion we may arrive at an intelligent basis for locating the bleeding point. The verumontanum, the prostate, the internal vesical sphincter and trigone may be grouped together as structures which may give rise to terminal hematuria. The hemorrhage in these cases may or may not be accompanied by pain, which is especially marked where there is acute

[1] Read before the Philadelphia Genito-urinary Society, April 22, 1918.

inflammatory lesion such as in gonorrheal prostatitis, tuberculosis, ulceration, or a calculus embedded in the posterior urethra or in the trigone. Ulceration of the verumontanum from long-standing infections, excessive instrumentation and masturbation may be the cause of bleeding. Ulcerative syphilitic gumma and malignant growths may bleed, but are comparatively rare, especially gumma. Instrumentation in some cases, no matter how gentle, is followed by bleeding; usually it is due to undue force and lack of skill. The author cannot urge too strongly that force at no time should be exercised in the employment of urethral instruments. The weight of the instruments, aided by the sense of touch plus experience, is the factor needed in their proper use.

In dilating strictures, and in stretching the urethra in the treatment of chronic purulent infections of the various glands, the mistake is often made of depressing the handle of the instrument down between the thighs, bringing its point violently against the vault of the bladder, and producing bruises or abrasions which bleed and form ulcers, which may become the seat of tuberculous infection.

Hemorrhage from the anterior urethra due to mechanical violence is commonly either self-inflicted, occurring in the very young from harsh handling of the penis, or the introduction of articles used for the purpose of masturbation, or curiosity; or follows in the adult from the cicatricial contracture of stricture.

It is not necessary to dwell upon hemorrhage in the acute stage of gonorrhea, or in rupture of the anterior urethra, as the source of the blood in the urine is obvious in these cases. Growths within the urethral canal are nearly always warty or polypoid, may bleed freely at times and without urethroscopic examination may not be recognized, for if the hemorrhage be free, it may color the entire urine.

If the blood comes from the posterior urethra, in the absence of an unduly large or congested verumontanum, or of an inflammation of the prostate with its accompanying pain, some of it finds its way into the bladder, and its origin may be clear.

Terminal hematuria or bleeding toward or at the end of urination, coming on gradually or suddenly, usually indicates a lesion in the prostatic urethra or the vesical trigone. Curiously in rare cases terminal bleeding may emanate from somewhere in the anterior urethra, hence the necessity for urethroscopic and cystoscopic examination to avoid error.

There are many other pitfalls which we must guard against. Many practitioners and even urologists still cling to the old habit of interpreting a bright-red or "wine-colored" urine as coming from a lesion in the bladder, and a chocolate or dark-red color from the kidney, but the writer has seen many cases in which just the reverse of both of these conditions obtained.

In confirmed masturbation, or in those subject to any prolonged irritation that occasions rapidly repeated congestion of the posterior urethra, we know that an enlargement and permanent congestion of the caput gallinaginis takes place. This slows and obstructs the flow of urine, and the spasms induced by effort to expel the last few drops often give rise to noticeable hemorrhage at the end of micturition; and from continuance of the hemorrhage in the intervals, the blood may flow back into the bladder, and also clot in a long plug in the urethra, giving rise exactly to the phenomenon of fishworm clotting one sees so often in hematuria from a renal source. Fishworm clots are also commonly assumed to come from the ureter where it is supposed to have coagulated and perhaps lain long enough within its lumen to become partially fibrinous before it descends. But these likewise may issue from growths near the ureteral orifice, and by reason of the flow of urine constantly against the bleeding point.

It is also true that often, in moderate internal hemorrhage from a kidney, the blood coagulates in the ureter, and lies there long enough to become partially fibrinous before it is dislodged, causing the appearance of long, thin, fishworm-like

clots in the urine from time to time. Similar clots occur in slow hemorrhage from villous growths situated in the bladder near the ureteral mouths. Several cystoscopic examinations may be necessary, either by reason of the fact that the bleeding may be too profuse to admit of a proper view, or the evidences may be completely absent on the first examination. To illustrate: A patient came under the author's care with a very marked hematuria. No pain on physical examination; *x*-ray studies were negative. Cystoscopic examination showed some large clots in the bladder, but no bleeding from either kidney. Several examinations were made with the same result. Finally, clear, bright-red blood was seen issuing from the left ureter. Operation was done and a large hypernephroma found. Such a case emphasizes the importance and value of the cystoscope, if not always in determining the cause, at least invariably finding the source of the bleeding. Occasionally no blood will be noticed in the urine coming from either kidney, but inspection alone is insufficient. A specimen should be obtained from each side by the ureteral catheter and examined microscopically, which will often reveal red blood-corpuscles. It must be remembered that blood coming from the ureter is not necessarily from the kidney, although this is most often the case, but there are instances in which the ureter itself is the source of the bleeding. Having then determined that the bleeding is from the kidney, and recognizing that it is only a symptom of some local diseased condition, it is necessary to determine if possible its underlying cause. Malignant disease, calculus, tuberculosis, and chronic nephritis are the most frequent.

Malignancy usually occurs in persons past middle life and is at some time or other invariably accompanied by hemorrhage, either coming on gradually in small quantities, or is sudden and profuse. Overexertion may increase it, while rest and relaxation have very little effect in diminishing it. The urine is heavily laden with blood, and upon microscopic study cancer cells may be found, but this is so unusual as to make it seldom worth while diagnosing it by this means. Usually the kidney is scarcely palpable, as it is neither enlarged nor nodular, especially in the early stages. Pain is a late symptom. The cardinal symptom of renal malignancy, therefore, is painless hematuria, usually profuse, undiminished by rest, coming on without apparent warning or reason and occurring in people past middle life.

As to tuberculosis, cystoscopic examination finds the usual picture in the bladder mucosa with the characteristic changes at or near the ureteral orifice. One or both sides may be involved. The urine should be studied for tubercle bacilli and some of the sediment injected into a guinea-pig, though a negative result does not preclude the possibility of renal tuberculosis. The tubercle may be located in the substance of a pyramid, independent of any connection with the renal pelvis. It may cause hematuria by congestion or interference with the renal circulation.

Stone in the kidney is much more frequent than tuberculosis, and occurs more often in patients previous to middle life. There may or may not be a history of having passed gravel or renal stones.

The incidence of pain accompanying renal calculus is very uncertain, and seldom can tenderness be elicited on pressure under the suspected kidney unless the calculus is accompanied by infection, in which case the kidney will probably be enlarged. The bleeding is not so profuse as in malignancy, and instead of being uninfluenced by exercise it is increased; absolute rest usually stops the bleeding. The *x*-ray is invaluable in these cases, but by no means infallible, especially in the case of uric acid stones. In addition to the blood in the urine there is also a considerable amount of mucus, and usually an excess of leucocytes and epithelial cells; crystals may or may not be present. The hemorrhage is usually not severe and occurs at irregular intervals. The kidney may or may not be enlarged and tender. The patient gener-

ally complains of some pain in the affected kidney. In a very thin subject and in women it is possible by means of vaginal examination to detect a thickened ureter when this condition exists.

The hematuria occurring in acute nephritis is characteristically prolonged and profuse, but by no means is this always the case. The presence of casts may give us a clue to the renal pathology. This bleeding may remain uninfluenced by rest.

Hemorrhage from the ureter will be seen by the cystoscope coming from its orifice. The lesion is either ureteral or renal, more commonly the latter. To attempt to locate a stone, the *x*-ray, or the passage of wax-tipped sounds into the ureter, is necessary. If there is no obstruction the catheter passes readily to the pelvis of the kidney. But this does not assure us of the non-existence of a growth or a tuberculous ulcer in the ureter; nor is there any essential difference between the attacks of colic induced by the passage of a slough from a tuberculous lesion, a calculus, or a blood-clot large enough or firm enough to excite non-rhythmical contractions of the tube. Lesions of the ureter itself are uncommon, and are usually the result of a passing calculus or a papilloma. When a hemorrhage is once located as coming from either ureter it is safe to assume in nearly every case that we have to deal with a diseased or injured kidney. Among other causes of hematuria are angiomatous degeneration of a pyramid; diseases of the adrenal; displacement; a shower of uratic or oxalic crystals, papilloma, multiple cysts, echinococcus; nephritis, acute and chronic; and sometimes atrophic change, which may not be detected by the microscope, but nevertheless exists and allows the blood to drip through the tissues as water from a sponge. To these may be added the effects of such drugs as turpentine, phenol, and cantharides.

Fracture of the kidney has been known to follow a push or blow against the abdomen or body, the individual striking against some object, or being struck, the body being caught or squeezed between opposing forces, or in the exertion of great muscular effort as in wrestling or severe lifting. If the source of bleeding is not self-evident cystoscopic examination should be immediately made, and the injured kidney cut down upon and mended if possible, or removed; for if there is enough injury to cause the appearance of blood in the urine the capsule of the kidney will also be found torn, and blood and urine will escape into the surrounding cellular tissues. Delay in such cases means long invalidism and often death.

Renal calculus is commonly painful, but not necessarily so. Uratic stones are sometimes so smooth that they may be in the kidney a lifetime and give rise to neither pain nor bloody urine, unless ascending infection from the bladder, or tuberculosis, attacks the kidney; or the stone, being small, and becoming engaged in the infundibulum of the ureter, produces congestive contractions and ruptures some small blood-vessel. But stone in the kidney is often accompanied by atrocious pain, and if rough or branched blood may be found by microscopic search at all times; while after muscular exertion profuse hemorrhage takes place—this is more particularly the case in the presence of oxalate stones, the crystals of which, set at irregular angles, are as sharp as glass.

To establish a diagnosis, resort should always be had to a skiagraph of the kidney and ureter upon the side painfully disturbed. But even when once obtained full reliance may not be placed upon the shadow, for sometimes this agent is misleading, showing stones where none exist.

Echinococcus is said by some to be a cause of renal hemorrhage. Microscopic examination of the urine should find the hooks sooner or later. Nephritis, too, either acute or chronic, frequently is the cause of hematuria. But in chronic nephritis, even if it be one-sided, there is the albumin which is present after the precipitation and removal of the blood; there are the casts in the intervals of the hemorrhages, and also the cardiac and stomachic symptoms to aid in diagnosis.

Vesical hematuria may be due to the hemorrhage diatheses, purpura, scurvy, and hemophilia; also specially malignant types of certain infectious diseases, as malaria and typhus fever. In both these groups of cases the bleeding exists concurrently in other mucous membranes, the hematuria being but one manifestation of a severe general disease whose recognition is usually not difficult.

Bloody urine may result also from the action of chemical poisons, such as cantharides, turpentine, phosphorus, and among workers in certain aniline dyes, notably fuchsine. Usually these substances affect primarily the kidneys, but may also cause bleeding from the bladder, especially the aniline poisons, which seem to have a special predilection for the vesical mucosa. Many cases of strangury and vesical hematuria have been reported among workers in aniline factories.

The most common cause of vesical hematuria is the congestion accompanying simple vesical inflammation, more especially of the trigone. The causative influence may be the gonococcus; the colon bacillus; the pus-producing cocci; the typhoid bacillus; or the bacillus aerocapsulatus. Occasionally the pathological change noticed will be a velvety edema of the interureteral fold, and all or a portion of the mucous membrane about the vesical outlet. This is due to the interference with the venous circulation, and is particularly prone to occur in women who have displacements of the uterus.

There is, however, another condition which occasions much vesical irritation, frequency of urination, and sometimes hematuria, but not often any definite pain. In this the capillaries of the posterior slope of the bladder, from the vesical outlet to the urethral openings, become greatly dilated and increased in number, and give rise to a telangiectasis the cause of which is not definitely known.

Congestion at the neck of the bladder is often the result of pressure from an encroaching enlargement of the prostate, pressing intraurethrally or intravesically. The bleeding may begin from rupture of a blood-vessel, and this may be induced by pressure or by muscular strain in attempting to empty the bladder, or by the forceful introduction of a catheter over the obstructing prostate.

The local causes include circulatory disturbances, trauma, bacterial or parasitic infections, and new growths.

Circulatory disturbances, such as the well-known phenomenon of hemorrhage following the rapid emptying of a distended bladder in cases of retention. This is explained as the result of sudden lowering of intravesical pressure. Passive congestion of the walls of the bladder, resulting from mechanical obstruction to the venous current, may cause the bleeding.

Varicose veins of the bladder wall, or so-called vesical hemorrhoids, have been demonstrated as a source of bleeding. This condition, though extremely rare, undoubtedly does exist, and may be aggravated by circumstances causing passive congestion of the pelvic organs, as in certain large abdominal tumors or pregnancy.

The Distoma hematobium and the Filaria sanguinis may invade the bladder. These parasites are rarely met with in this vicinity, but are common in the tropics and may be imported here. The Bilharzia parasites show a special predilection for laying their eggs in the wall of the urinary bladder. These break through the mucous membrane, setting up irritation and bleeding. The bleeding from this cause may be severe. The presence of filariæ in the circulation may lead to a blocking of the lymph channels of the bladder with the organisms; these may rupture with consequent hematuria and chyluria. The diagnosis should not be difficult, as in the case of the Distoma hematobium the finding of the ova in the urine is characteristic, and in the case of Filaria the presence of chyle in the urine and the finding of embryos in the blood should suggest the type of infection.

Tuberculosis of the bladder is a frequent cause of hematuria, the bleeding being often the first sign. It may be profuse or scant,

even microscopic, and usually occurs at the end of urination. Pus is present and pain and frequency of micturition soon appear. The urine is usually acid, and though repeated examinations may be necessary, tubercle bacilli are usually found. A purulent urine, acid in reaction, with the absence of organisms other than the tubercle bacillus, should always be suggestive of tuberculous infection. The finding of acid-fast bacilli in a catheter specimen, or a positive guinea-pig inoculation, establishes the diagnosis. Tuberculosis of the bladder is usually secondary to tuberculosis of the kidney, prostate, or genital organs. Palpation will usually show from which of these sources it comes; if not, the cystoscope should always be resorted to.

Stone in the bladder resembles tuberculosis in all of its symptoms so closely that many patients (where dependence has been placed upon the classical symptoms) have been operated for a calculus that did not exist. The two conditions, however, may occur together.

Uratic stones are often so smooth that they lie in a healthy bladder for a long time, and gradually increase in size, without causing cystitis or hematuria. Blood is usually present in the urine, but not always. To be sure of the presence of stone one must strike it with the searcher, see it with the cystoscope, grasp it bimanually, or find it by the *x*-ray.

Simple ulcerations or perforating ulcer of the bladder as a cause of hemorrhage can be diagnosed during life only by the cystoscope, or by operation. This condition is to be differentiated from tuberculosis by the clear-cut margins of the ulcer, by the persistent negative findings of tubercle bacilli in the urine.

The hematuria of severe acute cystitis is made manifest by the onset and character of the disease with its accompanying symptoms of strangury and tenesmus. When the neck of the bladder is the seat of the lesion the bleeding is usually terminal. The symptoms yield promptly to appropriate treatment. The cystoscope should not be required for the determination of this condition.

New growths constitute a very frequent cause of bladder hemorrhages. Papilloma, sarcoma, and carcinoma are the most common. Intermittent bleeding at first, usually painless, except in malignant cases, uninfluenced by rest or exercise and not relieved by drugs, is quite characteristic of the growth. In benign cases the bleeding may persist for years without other symptoms. Occasionally the bleeding in these cases may be fatal.

The tendency of these papillomatous tumors to bleed is accounted for by their extremely delicate structure; the filamentous connective tissue processes, which are covered with layers of epithelial cells, are often extremely vascular. After voiding urine, incident to the contraction of the bladder walls upon these growths, these delicate villi often become detached, rupturing small blood-vessels. Ultimately infection ensues with consequent cystitis, pyelitis, pyelonephritis, or if there be mechanical blocking, hydro- or pyonephrosis.

Microscopic examination of the urine in these cases may reveal fragments of villous growths in the sediment, though their recognition is somewhat difficult; nor does the finding of such fragments indicate their vesical source, since they may have come from above.

In the early stages of benign growths, when the bleeding is intermittent, painless, and without apparent cause, it cannot be differentiated from the bleeding of a kidney tumor, early kidney tuberculosis, or essential renal hematuria, except by the use of the cystoscope. In the later stages the condition may closely simulate prostatic hypertrophy with hemorrhage, or stone in the bladder, or ulceration, and the cystoscope is again necessary.

The hematuria of malignant disease of the bladder is usually continuous and accompanied by pain. In these cases rectal or vaginal examination will often reveal induration of the floor of the bladder, or a distinct mass. To differentiate cancer orig-

inating from the prostate, from that primary in the bladder, is often impossible by mere inspection or palpation.

The value of cystoscopy in the diagnosis of tumors of the bladder cannot be overstated. Data as to the size, situation, character, and number of growths, also as to the advisability of operation, can be obtained by this means only.

The method is applicable to all cases with the three following exceptions: (1) Where the urethra is impassable to the cystoscope; (2) where hemorrhage is profuse and persistent; (3) where the growth on account of its size and position prevents the necessary manipulation of the instrument. The first obstacle can usually be overcome by appropriate methods of dilatation, the second by appropriate irrigation, or by the selection of a favorable opportunity, and the last is very unusual.

As a rule, if a bladder tumor is suspected to be the cause of hematuria, cystoscopy is better done in an interval between hemorrhages. If a renal lesion is suspected, the reverse is true.

Rupture of the bladder by external violence at a time when the organ is distended is not uncommon. There is always more or less bleeding accompanying the other symptoms of this condition, the cause of which is always strongly suggested by the history of the case. Gunshot and other external injuries of the bladder are self-evident causes of bleeding. The contents of the bladder escapes through the laceration. In doubtful cases a catheter may be passed, some fluid allowed to flow in, and the return noted. Often there is no return at all. Contusion of the bladder, without actual rupture, may occur in childbirth from pressure by the fetal head and lead to postpartum hematuria. Trauma from within the bladder may be the result of instrumental treatment, or, what is of more interest and importance, may be due to the presence of foreign bodies, or calculi within the viscus, which are frequent causes of vesical hematuria.

Syphilis of the bladder is a possible cause of hematuria, but very rare.

The idiopathic, symptomless, or so-called essential hematurias often have no definite pathologic basis even at post-mortem, hence the difficulty, and occasionally the impossibility, of determining the cause and source of the bleeding. Undoubtedly many hematurias due to an unrecognized renal varix, angioma of the renal papillæ, polypoid growths in the ureter, or small uratic calculus have been called essential hematurias. It may readily be perceived how utterly impossible it is in these cases to make a positive diagnosis. Concretions have been found in an apparently normal kidney that could not be detected macroscopically, and only by sectional study was the cause of the bleeding determined.

TO RECAPITULATE.

1. A complete detailed history and a careful physical examination should be an invariable rule in every case of hematuria.

2. A positive diagnosis can be made in 99 per cent of all cases, by the judicious use of the cystoscope, ureteral catheter, urethroscope, *x*-ray, and laboratory.

3. The color or density of blood in the urine, or the presence and character of clots, are in themselves not sufficient criteria on which to base a diagnosis.

4. Too much reliance must not be placed on the clinical significance of initial or terminal hematuria, as indicating the origin of the bleeding.

5. Repeated cystoscopic, urethroscopic, *x*-ray, and laboratory studies may be necessary, before giving a definite opinion.

6. Many so-called essential, idiopathic, or symptomless hematurias are cases of bleeding arising from a renal varix, angioma of the papilla, ureteral papilloma, etc., conditions which are impossible of clinical recognition.

7. The presence of excessive urate, phosphate or oxalate crystals in the urine may produce hematuria, hence careful microscopic study should be made. Tubercle

bacilli casts, parasites or their larvæ, and hooks of the ecchinococcus, should be sought for in all hematurias of suspicious origin.

8. If blood is of suspected vesical origin, cystoscopy should be done during the intervals, when there is little or no hemorrhage.

The origin of hemorrhage coming from the upper urinary tract is best determined by seeing the blood as it issues from the ureteral orifice. Ureteral catheterization is rarely necessary in these cases, and should only be resorted to either for functional study or the collection of the separate urines from each kidney. Due allowance should be made for blood-tinged urine coming from the catheter, which might be due to instrumentation.

900 PINE STREET.

A RÉSUMÉ OF CLINICAL TECHNIQUES IN INFANTS.

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In the treatment of infants many physicians are not inclined to employ certain routine measures which are often very helpful and easy of execution. The infrequency of employment of these methods is probably due to the difficulty which they present at first glance. This is, however, only apparent.

The utilization of the longitudinal sinus, both for diagnostic and therapeutic purposes, is a simple, satisfactory, and safe procedure. It is most commonly employed in obtaining blood for the Wassermann reaction, the technique of which is essentially the same as for other purposes. All principles of asepsis should be carried out. A small area of the head is shaved in the median line over the fontanelle, cleansed with tincture of green soap, water, alcohol, and iodine. A 10-Cc. sterile syringe and hypodermic needle is used. The needle is inserted in the median line at the posterior angle of the fontanelle, and on entering the sinus a slight lessening of the resistance is often elicited; the plunger is withdrawn slowly, and if the blood does not appear the needle may be withdrawn or inserted farther as the case may require. Following this the wound is closed with a collodion dressing.

If an intravenous injection—*i.e.*, normal saline, sodium bicarbonate, dextrose, salvarsan, stimulants, etc.—is desired, a larger syringe may be necessary. After filling the syringe and expelling all air, the procedure is the same as the above up to the point where the blood first appears; the pressure is then reversed and the solution given slowly, usually requiring fifteen minutes, and the amount not exceeding one-sixtieth of the body weight.

Leaving aside the intravenous administration of normal saline, there are three remaining methods, viz., enteroclysis, hypodermoclysis, and the intraperitoneal, which often produce very striking results in some cases of inanition, malnutrition, atrophy, hemorrhage, when there has been a great loss of fluid and for purposes of stimulation.

Enteroclysis may be given by the continuous drop method, twelve or fifteen doses per minute, or by the intermittent method—that is, 30 to 90 Cc. every four to six hours—and the latter seems to be the more satisfactory. An Atlas syringe, with soft-rubber catheter attached, is filled with the solution, and after expelling the air the catheter is inserted five or six inches into the rectum and the solution given slowly, requiring fifteen to twenty minutes.

In the more urgent cases, and when the solution is not retained by enteroclysis, hypodermoclysis may be resorted to. The apparatus consists of a graduated flask, long rubber tube, short glass tube, short rubber tube, and large needle. To save time a "Y"-shaped glass tube with double attach-

ments may be substituted. The solution should be sterile and kept at body temperature, which may be accomplished by means of hot-water bottles surrounding the flask or by using small amounts and replenishing frequently. After preparing the field, the needle is inserted subcutaneously into the interscapular, lower abdominal or lateral thoracic regions and the solution allowed to flow in. As the tissues swell the needle may be inserted farther to facilitate a larger amount. From 60 to 120 Cc. may be given at one time and repeated in twelve to twenty-four hours.

Another means of accomplishing the same result is to use a large syringe and needle and inject the solution directly.

The intraperitoneal method is not entirely devoid of danger, but in the severe and urgent gastrointestinal disorders it seems perfectly justifiable, often beneficial, and has been free from harm. It is not recommended where there is distention of the bladder or abdomen.

The preparation of operator and patient should be the same as for an abdominal operation. The apparatus consists of a graduated flask, long rubber tube, short glass tube, short rubber tube, and large short-beveled needle. The solution should be sterile and kept at body temperature. After expelling all air, the skin and subcutaneous tissues are grasped just below the umbilicus, pulled upward, and the needle inserted through the linea alba at an oblique angle.

The advantages of this method are the quantity that may be given, the rapidity of absorption, and the rapidity and simplicity of administration. A small child will take from 100 to 200 Cc. in fifteen to twenty minutes.

The phenolphthalein test may be performed as readily in an infant as an adult, with the exception of catheterization, which is a little more difficult, but this is compensated for by only having one specimen to collect. One Cc. of phenolphthalein solution is injected into the lumbar muscles, and at the expiration of two hours the patient is catheterized (to safeguard against any loss of urine a specimen bottle may be attached in the meantime). After obtaining specimen the ordinary technique is followed: Dilute to 200 Cc. with water, render alkaline with 10 Cc. of a five-per-cent sodium hydroxide, and dilute further to 1000 Cc. Filter and compare with a Dunning color scale, or use a colorimeter. If the color is faint the dilution may be only partial and the result divided by the proportion taken. Normally the reading should be from sixty to seventy-five per cent.

The collection of urine from male and female infants is a comparatively simple process which is often attended by some difficulty, especially outside of hospitals.

One convenient form of apparatus is a square piece of adhesive plaster with a perforation in the center, through which the neck of a bottle or test-tube fits. In the case of the male, the adhesive is cut at the four corners, the penis is inserted into the neck of the bottle, and the adhesive applied to the surrounding skin of the pubic region; in the case of the female, an extra cut or notch is made in the portion that is attached to the perineum and the apparatus so applied that the mouth of the bottle fits snugly to the lower commissure of the vagina.

THE CAUSE AND PREVENTION OF POSTOPERATIVE GAS PAINS.

In concluding an article on this topic in the *California State Journal of Medicine* for July, 1918, ALVAREZ states that gas pains are better prevented than cured. A normal mesenteric circulation is more to be desired than an empty bowel. It is known clinically, and now shown experimentally, that purgation upsets the mechanism in the bowel which protects us from gas and pain. There is no valid excuse for preoperative purgation. It is a relic of humoral pathology. The postoperative results without "preparation" are excellent. Give food as late before and as early after operation as possible. Avoid heroic measures postoperatively.

EDITORIAL.

GAS AND OXYGEN IN TONSILLECTOMY.

In this issue of the THERAPEUTIC GAZETTE we publish the opinions of three skilful practitioners in the specialties of diseases of the ear, nose and throat in which they express their views concerning the value of different anesthetics for operation upon the tonsils. Medical literature contains more and more communications about the employment of this gas, with oxygen, in major surgery as well as in minor surgery, and particularly in obstetrical practice.

In this connection three articles which appeared in the *Indianapolis Medical Journal* for July, 1918, are of interest concerning the use of gas-oxygen in major surgery. Eberwein points out the advantages, and also the disadvantages, of this method, but believes that the first far outweigh the last, for in ninety per cent of the cases there is no nausea following the operation, the patient often asks for liquids, and oftentimes asks for food, and there is the additional advantage that he can be called back to consciousness and be of assistance to the anesthetist in a very brief space of time.

In abdominal surgery, Eberwein points out that if gas-oxygen is used, with proper technique it is possible to get as good, and sometimes better, relaxation as with ether anesthesia, but the surgeon must cut as if the patient were awake and ready to give information as to pain. For this reason operations under gas-oxygen must be done with great gentleness, which is certainly not a disadvantage in postoperative results. Eberwein fully recognizes that one is not able to operate on every case with gas-oxygen anesthesia, and therefore emphasizes, what we have already repeatedly stated, namely, that the anesthetic should be chosen for the individual case. Oftentimes he believes it wise to use infiltration anesthesia with novocaine (now called procaine) or quinine and urea hydrochloride.

In the second article, by Lillian B. Mueller, after pointing out the general advantages of gas-oxygen, she discusses its value in tonsillectomy. The administration of the gas becomes somewhat complicated because of the field of operation, and this makes it necessary to force the gases, and at the same time to provide an open airway, with a nasal inhaler in place of the ordinary rubber face-cushion and face-piece. She insists most emphatically upon the importance of maintaining an open airway, and that the amount of oxygen must be cut down to a much lower percentage than is usually employed for obvious reasons. She thinks that when a rapid method of operating on tonsils, as, for example, that of Sluder, is used, the patient recovers so quickly that he clears his own throat of blood, for he is only under the anesthetic a few minutes. She also believes that if the tonsils must be dissected out gas should not be administered to the patient in a horizontal position. On the contrary, he should be placed in a sitting posture leaning forward. Last of all, she points out the need of team work between the operator and the anesthetist when this gas is employed in tonsillectomy.

Following her paper is one by McKaskey upon 120 tonsillectomies under gas anesthesia. He quotes a number of prominent anesthetists who practically always employ nitrous oxide. In patients that he reports McKaskey employed the Sluder method. Dr. McKaskey's conclusions from his large experience are as follows:

Hemorrhage.—At the time of operation there is a slight difference in the amount of hemorrhage, it being more profuse, but the amount of blood lost is no greater than from the same number of cases operated under ether. There is a more rapid clotting of blood, the patient is able to ex-

pectorate the blood, and there is no vomiting of blood.

Nausea.—Practically the entire series of cases were free from nausea, which is a very good asset for the patient's comfort.

Ability to Eat.—Many of these cases were operated upon after 4.30 P.M., and all were able to eat ice cream at the dinner hour.

Pain.—He does not think these cases suffered nearly so much pain as those cases operated upon under ether, as there is no sponging of the fossæ; this lessens the trauma and thereby causes less inflammation.

Length of Time in Hospital.—Some four or five of these cases remained in the hospital as long as forty-eight hours, the rest leaving in twenty-four hours or less. Children make a great deal of noise occasionally, for about an hour, but no more so than from ether.

In cases having the remotest suspicion of tuberculosis gas should always be used. In this any one having to do with tuberculosis will agree, or at least should, from what is known of the subject at present. In but three of these cases was there a rise of temperature above 99.6°. Certain forms of nephritics should perhaps have gas—at least it will not harm them.

In the general run of cases, which will permit of the Sluder operation, it is not bad practice to use gas anesthesia.

It is not a bad thing to have your patient return to the room awake and quite able to converse with the relatives.

McKaskey had the opportunity of seeing practically all of these cases since the operation. He believes the results obtained compared favorably with those of others whom he has examined.

Gas may be employed for removing the tonsil, after it has been loosened from the capsule, when a local anesthetic is employed.

In conclusion, he would not have us think that he does not use ether, for he uses ether a great deal more than he does gas, but where the case warrants it he thinks it is good practice to use gas.

THE INTRAMUSCULAR USE OF QUININE.

We are quite conscious of the fact that in the issues of the THERAPEUTIC GAZETTE during the past twelve months we have repeatedly discussed the use of quinine administration in various doses and by various methods in the treatment of malarial infection, and were it not for the great importance of this subject and its very general interest we would not feel justified in dealing with the use of quinine in malaria again at so early a date.

It will be remembered that about a year ago we called attention to the report made by McLean, and others in the United States Navy, in regard to the excellent results which they obtained from the intravenous injection of quinine in doses large enough to destroy the malarial parasites, and that these injections were not very dilute or bulky, but fairly concentrated, the only precaution taken being that the injection was given with great slowness, the patient in the recumbent posture, and was made to rest for some time after the dose was administered. So, too, we have called attention on a number of occasions to the almost bitter arguments which have been carried on by medical men in British India as to the efficiency and safety of intramuscular injections, and we have called attention to the need of either intravenous or intramuscular injections in a certain proportion of cases because of the virulence of the infection, difficulty of absorption by the stomach, or uncertainty as to whether the patient actually swallowed the quinine which was given him.

It would appear at the present time that those who are in favor of intravenous injections, when the stomach cannot be used to get the drug into the body, have the better of the argument. Those opposed to intramuscular injections have stated that they are painful, that tetanus sometimes results, and that, when this evil does not occur, nevertheless a slough may form.

Along this line of argument we note with

interest a contribution by MacGilchrist, a major in the Indian Medical Service, who has on more than one occasion raised his voice against intramuscular injections. In the *Indian Medical Gazette* for December, 1917, he publishes a paper in which he reports an instance of acute necrosis of part of one of the gluteal muscles following the injection of eleven grains of quinine bihydrochloride dissolved in thirty-four minims of boiled water. The injection was not followed by any improvement whatever and the patient died thirteen hours afterwards. Permission having been received to make an autopsy the tissues at the point of the injection were excised. The skin over this area was of a very dark, leaden hue, almost black. The track made in the tissues by the needle when it was inserted and withdrawn showed necrosis, and the area in which the injection was made was soft and pultaceous. MacGilchrist is one of those who advocate dilute solutions of quinine, if quinine is to be used intramuscularly, but we have on previous occasions quoted other clinicians who have opposed him. The diluted solutions he claims are rapidly and completely absorbed, do not produce irritation or necrosis, and the local injury is so slight that the danger of tetanus infection is diminished.

It is interesting in connection with this report of MacGilchrist to find an article in *La Presse Médicale* of March 4, 1918, by Léenhardt and Tixier on the "Systematic Use of Intramuscular Injections of Quinine in the Treatment of Malarial Infection." These authors report their experience with a large number of patients in Macedonia, and are earnest advocates of intramuscular injections. Their claim is that these injections are followed by an almost immediate disappearance of the manifestations of the disease and of the parasites in the blood; that absorption is rapid; that the digestive system, if disordered, is not still further disturbed.

They recommend the use of quinine and urethane in the proportion of seven grains of hydrochloride of quinine and three grains of urethane in each cubic centimeter, the solution being kept in hermetically sealed ampoules. If the quinine is found to be crystallized it can be liquefied by immersing the ampoule in hot water. The skin should be disinfected with tincture of iodine, and the solution before it is injected, if not in an ampoule, should be boiled to be sure of its being sterilized. Care should be taken that subsequent injections are given nowhere near the early ones, and the area recommended is in the upper part of the buttocks. They claim that they have given over eight thousand injections in the space of seven months without causing any suppuration. In one case a hematoma developed.

The method of dosage which they advocate varies with the condition of the patient. If there is need of intensive treatment as much as twelve grains of quinine is given, and this is repeated daily, for ten days, if possible at a regular hour. On the fifth or sixth day they claim that the patient's color improves, and by the tenth day he appears almost normal as the result of what might be called this heroic method. If the manifestations of the disease are not so severe smaller doses may be given, or the same dose of quinine may be administered every four days, or not oftener than every two or three days. They believe that for the rapid development of apyrexia the systematic muscular injection is the method above all others, and that relapses are less prone to occur if this plan is used than if quinine is given by the mouth.

It would appear that where there is such wide divergence of opinion in regard to the efficiency and safety of a radical procedure there must be some explanation for the evil results obtained by certain physicians and for the good results obtained by others. A number of factors may be influential. Given to one who is about horses the danger of tetanus is manifestly far greater than when the drug is given intravenously to those not exposed to this source of infection. Given to a patient greatly devitalized by exposure in service and dis-

ease it is readily conceivable that quinine may be sufficiently irritating to cause a slough, whereas if injected into fairly healthy tissues with normal vital resistance it may be received without local trouble. Again, the urethane may have some modifying influence upon the local effect of quinine, and the aseptic technique in one man's hands may be infinitely better than in the hands of another.

Our own feeling in the matter is that if quinine seemed contraindicated by the mouth we would use it intravenously, with proper precautions. All the evidence seems to indicate that it ought never to be given hypodermically. Additional facts must be presented before the intramuscular injection of quinine can be regarded as a wise procedure, except in very unusual cases.

THE RELATIONS OF THE TONSILS TO ARTHRITIS.

In an article contributed to *Minnesota Medicine* by Warren, he begins with these words: "Infectious arthritis in any of its varied forms constitutes one of the most definite indications for tonsillectomy. We cannot, however, by inspection alone, accuse a pair of tonsils of being the seat of infection. The previous history is important as to the number and severity of attacks of tonsillitis or quinsy, and whether or not there has been 'rheumatism' in either its acute articular or any of the numerous phases of the so-called 'rheumatic diathesis.'"

This statement contains truths which cannot be denied and which deserve attention, but the question as to whether infectious arthritis is a definite indication for tonsillectomy can be debated. There can be little doubt that diseased tonsils at times are the starting-point of infection which develops into serious conditions in other parts of the body, particularly the heart and the joints. Neither can there be any doubt that septic foci at the roots of teeth may also prove the starting-point for such infection. That both of them may exist in the same patient without, however, being the cause of any secondary infection, or may exist when the focus of primary infection is actually in another part, cannot be denied. In other words, it may be fairly stated at the present time there is a tendency to consider every case of arthritis as being due to bad teeth or bad tonsils, with the result that the teeth are pulled or the tonsils are extirpated without any benefit to the patient, and indeed, in some instances, with resultant harm, since the solution in continuity in the tissues produced by the operative procedure opens up avenues of infection which did not exist before.

Warren, in the article to which we have referred, well points out, as we have done on previous occasions, that the size of the tonsil has nothing to do with its virulent properties. The buried tonsils, or the ones which although enlarged are, nevertheless, flush with the near-by pillars, are often the seat of a multitude of malignant organisms, whereas the greatly overgrown tonsil, which is largely fibrous and which projects on either side till it almost touches the uvula, is innocuous from the infectious standpoint.

Again quoting Warren, "given a case showing chronic or subacute rheumatism we are at once confronted with the question, Shall we operate, and, if so, how soon?" He believes that there can be no question that an operation is indicated, provided, of course, that other sources of infection have been eliminated, and we think that this sentence is also worthy of remembrance in view of what we have already stated. The presence of a possible pyelitis, prostatitis, or urethritis should be excluded before the tonsils receive all the blame; this is the more important because, if the tonsils are not responsible for the general infection, the condition of the patient may be made worse either as the result of the administration of the anesthetic or by causing infection from another avenue of entrance.

As Warren well points out, a mild degree of infection of the tonsillar wound follows

an operative attack in some cases, whereby a moderate degree of temperature elevation is produced for two or three days, and it is not infrequent to have a slough, or what appears as a false membrane, from over the operative area which represents necrosis from which septic absorption may occur. He records a case in which general infection having taken place an operation upon the tonsils was performed with the hope of preventing further infection, and although the operative wound promptly healed, the neck became stiff, a left-sided hemiplegia developed because of a septic embolism, and the patient died thirty-eight days after the tonsillectomy. It would seem, therefore, that we are not to be timid about operating upon tonsils which are diseased, but, on the other hand, we should be cautious.

It is interesting to note that simultaneously with the appearance of the paper to which we have just referred another one has been contributed to the *Ohio State Medical Journal* upon "The Results of Animal Inoculations with Material Obtained from the Tonsils of Cases of Acute Rheumatic Fever" by Kelly. After reviewing some of the literature dealing with the microörganisms of rheumatism and recording experiments which were made as indicated by the title of his paper, he reaches the following summary and conclusions:

1. Material obtained from eight cases of simple hypertrophied tonsils failed to produce arthritis in rabbits.

2. Material obtained from the tonsils of four cases of acute rheumatic fever in which fever and joint involvement had been absent for from three to twenty-five days failed to produce arthritis in animals.

3. Material obtained from the tonsils of three cases of acute rheumatic fever during the presence of fever and joint involvement, produced arthritis in all of the animals surviving the immediate effects of the inoculations. Two of these cases showed gram-positive, non-hemolytic, non-green-producing streptococci in the joint fluid, and the other a staphylococcus albus.

4. Non-hemolytic streptococci predominated in cultures from the tonsils of fourteen of the fifteen cases studied. One case was not studied in this manner.

5. These findings suggest that perhaps it is better to remove tonsils during an acute attack of rheumatism while the organism present is localizing in joint surfaces, rather than to delay too long until its tissue localization changes in favor of heart valve, appendix, etc. Certainly the joints may flare up, but that is not as permanently injurious to a patient as a heart valve or muscle infection, and usually subsides in a very few days. It goes without saying, however, that the tonsils should not be removed unless the acute process within them has subsided sufficiently to justify the operation.

These conclusions are of interest and value, although they do not embody results from a sufficiently large number of cases to be accepted as completely settling the question, the more so as the results are somewhat contradictory.

The fifth conclusion is especially a subject for debate. The suggestion that it is proper to remove tonsils during an acute attack of rheumatism is, we believe, not wise, and the author in the last sentence of conclusion 5 almost contradicts the first sentence in the same conclusion, when he adds that it goes without saying that the tonsils should not be removed unless the acute process within them has subsided sufficiently to justify the operation. As a matter of fact, when rheumatism, so-called, complicates tonsillitis, acute or chronic, operation upon the tonsils is somewhat allied to locking the stable door after the horse is stolen, for, to use another metaphor, the cat is out of the bag and pathogenic germs have escaped from the tonsils, have been carried to the joints, and there is probably much more danger of a further inoculation of the patient by operation than there is in allowing nature's protective processes, both local and general, to deal with the organisms which are doing him damage.

It seems to us that this is a typical instance

in which the rule, do no harm in attempting to do good, holds with much force. If, on the other hand, a patient appears with a history of arthritis in the past and bad tonsils are found, then, for the purpose of preventing subsequent infection of the general system, operative interference in many instances will be undoubtedly wise. After all, the articles we have quoted illustrate once more the fact that no general rules can be laid down in practice; that each case must be studied by itself; and that such study is what the patient is paying for and has a right to demand in place of glittering generalities. He must not be classed in a group, but considered as an individual proposition.

THE RELATION OF LYMPHOCYTES TO RESISTANCE IN TUBERCULOSIS.

It has been recognized for a long time that certain tuberculous patients present in the blood and in other fluids a distinct relative increase in lymphocytes. Other persons not known to be definitely tuberculous, but who do not appear to be in perfect health, also reveal sometimes a relative lymphocytosis. The interesting question as to whether there is any actual relationship between an increased number of lymphocytes and tuberculosis has until recently been unanswerable, but certain researches which have been made during the last few years would seem to indicate that increased lymphocytosis in tuberculosis may have a prognostic value somewhat akin to the increase in the polymorphonuclear leucocytes which is seen in pneumonia and some other acute infections.

In a recent issue of *Colorado Medicine* Downing and Allison record the investigations which they have made along these lines and quote some of the evidence which has been accumulated by others. As they well point out, the remarkable change for the better which tuberculous patients often show makes it seem as though the body accomplishes the production of some substance, or cell, capable of holding the tubercle bacilli in check. They seem to think that in these cases in which the patient has made a comparatively successful struggle against the disease the lymphocytes are always found increased, whereas in those forms or cases which are running an unfavorable course these corpuscular elements show no material change. In support of their view they point out that lymphocytes are almost constantly present about the periphery of the typical tubercle, and while they admit that their presence may be due solely to the fact of tissues being destroyed, they point out that their excessive number often leads to the formation of the lymphoid tubercle as distinguished from the large cell tubercle characteristic of the disease. They also emphasize the fact that lymphocytes make up ninety-five per cent or more of the cells of the pleural exudate and think that they exercise, directly or indirectly, a bactericidal influence.

Heineke has shown that the use of the *x*-ray destroys lymphoid tissue; and Murphy, Ellish and Morton have shown that if tissues are exposed to the *x*-rays they become singularly susceptible to tubercular infection.

Again, it is pointed out that Murphy has shown that when a marked lymphocytosis is artificially induced the resistance to tuberculosis in mice is greatly enhanced, but that this resistance may be diminished if, by the use of the *x*-rays, the lymphocytes are decreased. Additional evidence lies in the fact, noted by Webb, that lymphocytes are increased at high altitudes in the tuberculous, although there is no increase in the lymphocytes in natives in this altitude; and Brecke has claimed that a decrease of the lymphocytes in the blood occurs when the disease grows worse.

The research of Downing and Allison was carried out in a series of patients at a sanitarium in Colorado during the past two years, the blood examinations being made on the arrival and when the patients left, six or nine months later.

It does not seem to us that the records which they present are very definitely in support of their views, except in nine pneumothorax cases in which the lymphocytes before and after compression were examined. In practically every one of these instancese there was an increase of from thirty-three to seventy-five per cent, and they believe that the fluctuation in the number of lymphocytes in the blood goes hand in hand with the fluctuation in the general condition, increasing with improvement and diminishing with relapse. While Downing and Allison do not claim to have placed this matter upon a solid foundation, they think that the facts which they have brought together may provide a lead toward further knowledge concerning the relationship of lymphocytosis and tuberculosis, and it is possible that a still further lead may be developed in that an artificially induced lymphocytosis may be employed to aid the patient in his struggle with the malady.

THE OPERATIVE TECHNIQUE OF INGUINAL HERNIA.

It is the consensus of opinion among surgeons of largest experience that the best results in the treatment of hernia are obtained by the Bassini operation, or some modification of it; a modification of detail rather than of principle. Perhaps the modification most largely accepted and practiced is that by which, after removal of the sac and lifting of the cord from its bed, the three layers of the abdominal wall constituting the upper and anterior portion of the inguinal canal are sutured to Poupart's ligament, the lower remaining flap of the external oblique being then stitched up over the cord and sewed in place. There is thus made a strong wall with a double layer of the external oblique. There is, of course, danger of too tight pressure on the cord by the external oblique when this fascia, together with its underlying muscles, is brought down to Poupart's ligament. Moderate care will avoid this contingency.

Skillern in the *Pennsylvania Medical Journal* for July, 1918, on the basis of nineteen cases, describes what he calls a special type of operative technique, particularly that which he regards applicable to young adolescents, with, as a rule, empty nonadherent hernial sacs. He uses, when practicable, local anesthesia, ½-per-cent solution of novocaine, without adrenalin, and endeavors to make a nerve blocking; injecting above and medially to the anterior iliac spine. Further details concerning this procedure are not given. After ligation of the sac, if this be thin-walled, the external oblique is imbricated and the skin closed, the opening in the cremasteric fascia, through which the sac is delivered, having been previously sutured.

It is a simple and interesting method, which has had some advocates. It has been practiced for years, and will doubtless be successful in many cases. Since it is being extensively tried in this war, its true value may be determined, providing careful records of operation are kept and providing a recording system be insured which allows of the following of these cases. Since neither of these fundamental conditions is fulfilled, it is probable that the educational value of the enormous number of hernia operations now being performed will prove of little permanent value to the profession. Skillern allows his patients out of bed at the end of a week and sends them home on the eighth day. When to his twenty cases are added the thousands now in the army, with the final results in regard to radical cure, a just estimate of the value of this simplification of procedure may be formed.

Considering the circumstances that a hernia always produces some discomfort and that its tendency is to increase rather than cure; that it is often attended by actual danger to life; that in young men it can surely, promptly and safely be cured by operation which can be performed absolutely without pain under local anesthetic; that this operation is attended by a risk to life so light as to be negligible; that the major complaint of those operated upon is

that they did not have it done sooner; it seems singular that any man should consent to the inconvenience or discomfort of wearing a truss, particularly if he be in his twenties or thirties.

When it comes to the matter of a direct hernia, which implies sometimes a congenital effect, usually a gradual weakening of the abdominal wall incident to advanced years and sedentary life, the unphysiologic attitude assumed in defecation and the increasing weight of the abdominal contents, surgical procedure cannot be urged with such assurance. The operation in itself is equally innocuous and always temporarily successful. Since, however, it does not entirely overcome the underlying cause which in the young man is usually a congenital sac, the chance of permanent cure is never so great; moreover, into these hernias the bladder is not infrequently dragged. Under such circumstances, if the surgeon is considerate of his own reputation, he will be loath to urge an operation, or if he advises it, will be reasonably conservative in his assurances of a definite and lasting cure.

GUNSHOT FRACTURES OF THE JAW.

The experience of this war has shown that the mandible in its basal portion has extraordinary power of bone reproduction after injury; a function exhibited not in the least by the alveolar portions of the bone.

It has also become clear that after injury immobilization is of vital importance. Where the jaw is broken into many fragments, these should be replaced in good position and must thus be held. The displacing factors are incident to the circumstance that the depressors of the jaw are attached in front; whilst the levators are inserted in the region of the angle and ascending ramus.

For fixation it is usually needful to associate external apparatus, maxillary arches, and osseous sutures. All the sutures are placed from within the mouth, the fragments being denuded to allow the application of wires; this usually under local anesthesia. The suture wires are not removed for about a month, and are applicable only in cases in which there is considerable fracture of the jaw, soft-part lesions, and total or partial absence of the teeth. Even in extensive injury, the chances of union are good where the fragments are replaced in proper position and contact; moreover, future grafting is made easier and autoplastic operations, should they be required, are facilitated.

The method of procedure when the crushed portion corresponds to the incisors, canines, and premolars, the displacement being downward, is practiced thus (*Review of War Surgery and Medicine,* August, 1918):

A German silver arch, in the form of a bow, is fitted and cemented to the teeth in such a way that the two posterior segments are solidly maintained in perfect occlusion. This arch follows the curve of the bone at the height of the middle of the teeth. The suture wires hold up against the arch the bony fragments at their normal height, reestablishing their normal points of contact. In the same way, in case of a horizontal fracture, the inferior segment is made to approach the preserved segment.

In similar cases, with absence of teeth on one side, bands of metal are fitted to the existing teeth, prolonged as far as the premolar region of the opposite side. They are cemented to the teeth and the suture wires placed as in the first case. If the lack of teeth has done away with the normal occlusion, a saddle of vulcanite is made which keeps the fragment down in correct position.

An extra-buccal piece may act as an adjuvant to immobilization, consisting of a plate of vulcanite fitted on the forehead and temporal regions, bound to the maxillary arch with a rigid wire.

When the fracture reaches from one angle to the other with extensive crushing displacement and absence of teeth, the same immobilization is required as in the first two types, but with slight modifications.

Larger silver wires are fixed to the ends of the rami. An arch is fixed to them, upon which the bony fragments are suspended as heretofore; the upper teeth, when present, may serve for sustaining the apparatus; if not, recourse is had to an external appliance.

The post-levator fractures—*i.e.*, those which pass behind the insertions of the levator muscles, in the condyloid process—are distinguished from other mandibular fractures by the fact that the posterior fragment cannot be held by fixation apparatus. This condition has led to two tendencies in treatment. The first consists in leaving the work of repair to nature, the second in the attempt at immobilization by locking the two jaws.

Villian teaches that the conditions for correct physiologic treatment of these fractures are realized as follows:

In cases without loss of substance, favorable direction of the line of fracture, and consequently no displacement or easily reducible displacement, all that is necessary is an apparatus for neutralizing the antagonistic muscular forces and permitting the functional movements of the jaw. This is achieved by means of a grooved guide attached to bands on the upper molar teeth, in which slides a lug attached to the lower molars.

If there is displacement in either a horizontal or a vertical direction, or both, reduction must be brought about, followed by neutralization of the displacing muscular forces, and guided normal jaw movements. This is realized through the employment, first, of extensible vertical or horizontal shafts or a combination of the two, followed by the sliding lug apparatus. These extensible rods are attached to bands on the upper and lower teeth.

This description of dental apparatus as applied to injuries of the jaw is too technical for the comprehension of the ordinary surgeon, unless he has seen its application. It is quoted from original articles with the purpose of calling attention to the circumstances that in the dentist's hands fractures of the jaw habitually do better than they do in the hands of the surgeon, that the dentist not only restores contour, but function; and even if there be extensive destruction of both bone and soft parts, he, by his early treatment, supplemented later by the work of the plastic surgeon, can to a large extent prevent those hideous deformities which were noted in the early part of the war.

REPORTS ON THERAPEUTIC PROGRESS.

PREPARATION OF SOLUTIONS OF SALVARSAN AND ARSENOBENZOL FOR INTRAVENOUS USE.

This well-worn but interesting topic is discussed again by GOODMAN in the *New York Medical Journal* of June 22, 1918. The directions he gives are as follows:

The preparation of salvarsan or its equivalents begins with the cleansing of the glassware. The necessary cylinders, gravity tubes, and funnels are washed twice with soap solution, using a long-handled brush. They are then rinsed in running tap-water, and again in distilled. After drying, the glassware is baked in a sterilizer at 160° Centigrade for thirty minutes. There is no doubt that this procedure, oft repeated, is wearing on the glassware, but cleanliness above all things in intravenous work is essential. Wet sterilization is less desirable. Distilled water should be used to boil the glassware, otherwise a film of deposited salts and dirt is evident. The mixing cylinders should be drained as dry as possible before use. Rubber tubing, if new, should be boiled several times with at least three changes of water to remove the powder both within and without. Tubing once used should be rinsed thoroughly before boiling.

The water used for salvarsan solutions is freshly distilled, and not more than six hours old. Although the modern stills de-

liver sterile water, he boils all water for seven minutes.

The sodium hydroxide in a fifteen-per-cent solution is prepared with freshly distilled water, and sodium hydroxide sticks are used that are free from the sodium carbonate and sodium bicarbonate which forms if the sticks are exposed to air. Goodman has kept sodium hydroxide solutions in closed bottles and has never failed after a few days to find a granular or amorphous type of precipitate. At one time he thought that this meant a fungous growth, but culture on Sabouraud's medium was negative. Microscopic examination disclosed no spores, nor any crystalline forms that could be recognized. The suggestion that the precipitate was the result of the basic action of the solution on the surface of the glass containers has not appealed to him because the bottles never became cloudy. Freshly prepared solutions free them from any deep concern, and he has seen solutions with a heavy precipitate in the bottom of the container used with no ill effect.

The salvarsan ampoules are taken from their wrappers and put into a dish of alcohol. Air-tight tubes float, but tubes that are defective and have admitted air sink, or the alcohol reaches the inside of the tube and moistens the powder. No tube that does not float is used. The tubes are dried with sterile gauze, as is the alcohol-sterilized file, before the tubes are opened. When using salvarsan, neozol (Billon), the ampoule is readily opened by scratching the neck with the file and smartly tapping the far end. This method is not desirable with ampoules of arsenobenzol of Schamberg because the powder of this arsenobenzol has great cohesiveness and comes from the narrow neck with comparative difficulty. He opens Schamberg's tubes down on the body of the ampoule, and the powder drops out easily. If it falls to the bottom of the cylinder as one mass, it is wise to shake the cylinder from side to side and break up the lump.

Water is now added to the powder, using approximately 5 Cc. to the decigramme. For ease in bringing on solution of Philadelphia arsenobenzol, this water should be bubbling, boiling hot. Shaking for a minute is all that is necessary to bring about solutions of all products except Schamberg's. His arsenobenzol requires vigorous shaking for at least five minutes for the beginner, but with experience the time is reduced to a minute and a half for a complete clear solution. One should always release the stopper from the cylinder for a moment after shaking to permit the heated air and liberated gas to get out, otherwise they are likely to force the stopper out and literally shoot some of the solution along. Goodman advises against the use of the technique, especially for Schamberg's product, which advocates dropping the powder on the water which is first measured into the cylinder. He has never been able to get a complete solution with this method.

Sodium hydroxide solution is now added to solutions of salvarsan, diarsenol, or arsenobenzol, by the gradual drop-by-drop method until the neutral point is almost reached. Then shake after each addition of alkali and determine this by the speed at which the precipitate is formed. He has observed that the slower the alkali is added, the more precipitate is formed, and on one occasion the precipitate filled the entire cylinder. On further addition of the hydroxide solution the precipitate dissolves. The cylinders should be shaken slowly and a slight pause made before further alkali is added, as this feature is noted. Often the drop of sodium hydroxide that was thought necessary is discarded after this precaution. The final neutral solution is absolutely clear. If the first solution is not complete and alkali is added, there will always be undissolved particles in the cylinder even when the neutral point has been reached. It is very easy in such incompletely dissolved cases to overalkalinize unless we filter before attempting to neutralize.

On several occasions Goodman has determined how near neutral the solutions were by the following test: A tube of salvarsan or arsenobenzol is dissolved and neutralized, the number of drops of sodium hy-

droxide needed being counted. In another cylinder a second tube of salvarsan or arsenobenzol is dissolved. This acid solution is poured into the cylinder of neutralized solution. If a precipitate forms, it proves overalkalinization of the first tube. He counts the drops of sodium hydroxide necessary to neutralize the joint solution, and finds that it requires about four or five drops less. In other words, he has overalkalinized the first tube by half this number of drops. Such a procedure should be carried out if a solution is unintentionally overalkalinized, and both tubes of the drug can be utilized. It is possible to render the solution acid again with dilute hydrochloric acid, but he has never had occasion to use it. It is impossible to get a good solution if salvarsan powder is added to a neutralized or alkalinized solution of the drug.

He has compared the amount of alkali necessary to neutralize salvarsan and arsenobenzol. The popular opinion has been that arsenobenzol required more sodium hydroxide, and he found that this drug required about one-third more than salvarsan, sustaining this belief. He has no comparative notes for diarsenol.

Goodman ordinarily uses for injection 20 Cc. of fluids to the decigramme. At one time this second dilution was done with saline, but now he uses sterile water, and finds no ill effect. It has been his purpose to learn the toxicity of salvarsan solutions of various dilutions as compared with red blood cells, but no opportunity has presented itself as yet. Exceptionally, he has given salvarsan concentrated to 10 Cc. to the decigramme, but unless used as a time-saving measure in a dispensary, for example, he hesitates to recommend it, and cannot deprecate too much the method of injecting five decigrammes in a total of 10 Cc. or 20 Cc. which has recently been described. This method has been used, and the endophlebitis which it causes renders the vein unfit for further injection. If any solution injected is highly alkaline, it causes a temporary hardening of the vein, and it may be several weeks before it can be used again. In cases in which there is only one readily accessible vein, such a mishap may cause unnecessary inconvenience.

For the injection proper, take a single gravity tube of 250 Cc., nozzle tip at the bottom, and rubber tubing about five feet long. A window of glass tubing may be inserted. At the end of the rubber tubing is a male connection which fits the slip-on hilt of the Fordyce needles. The entire apparatus is suspended with its outlet tip about two feet above the level of the vein into which the needle is to be introduced. Water is first run through the gravity tube to displace all the air, and create a complete water system from a visible level in it to the end of the tubing. A pinch-cock clamp on the rubber tubing holds well enough, and does less damage to the rubber than does an artery clamp. The solutions are always filtered through wet gauze from the mixing cylinder to the gravity tube. If dry gauze is used it is very possible for a few loose ravelings from its under surface to be washed into the filtrate. The solution should not vary very much either above or below blood heat. It is not necessary to use a thermometer; judging the warmth of the cylinder with the hand suffices.

CAMPHOR IN THE PARTIAL OPTIC ATROPHY OF GLAUCOMA.

In the *Prescriber* for May, 1918, HARRY points out that it is the prevailing opinion that after diagnosing a case of glaucoma, and performing some operation for the relief of tension, treatment has been completed. Except in the early cases, however, this is not so.

The weakest part of the eye is the optic nerve entrance, and this is the first to yield under a rise of pressure. The whole nerve head is pushed backward, and the individual fibers are not only stretched at a point where they are thinnest—that is, where they leave their medullary sheath—but they are also compressed against the sharp edge of the sclerotic coat. Progressive atrophy of the optic nerve is the result. The successful performance of an operation for reducing the tension in a certain percentage

of cases stops the progress of the atrophy; in many cases, however, the vision continues to fall, the fields do not enlarge, and the excavation of the disk remains undiminished.

It is usual before operation to give a guarded prognosis and to promise the retention of no more vision than the patient possesses at the moment of surgical interference. In about thirty per cent of the cases at two months after operation the visual acuity is less, pallor of the disk is more noticeable, and, although the tension is reduced, the atrophy progresses.

The explanation given by those who have worked at the pathological anatomy of the optic nerve in these conditions is that from the outset it is an "essential atrophy," independent of the atrophy consequent on increased intraocular pressure, and is due to autointoxication. It is possible that the tendency in the nerve to atrophy is latent, and that the injury produced by pressure encourages its development.

It was felt that, whatever be the cause of the atrophy, some form of stimulant might increase the vitality of the surviving nerve fibers. Several substances were tried from time to time with more or less success. Alcohol and other narcotic drugs are obviously contraindicated; strychnine and phosphorus are too fleeting in action; while quinine and the valerianates are apt to produce an undesirable constriction of the arterioles.

Camphor, however, has been found to give satisfactory results. It is used in the form of a ten-per-cent solution in liquid paraffin, 20 to 30 minims being injected into the muscles of the back three or four times weekly. In its properties camphor to some extent resembles phenol and thymol; in addition to its action as a stimulant, it is a corrective of toxemia; and its behavior toward the vascular system is favorable in the conditions underlying the etiology of glaucoma.

One disadvantage of its use is its insolubility and slowness of absorption. In several cases treated four years ago, when 10 minims of a 20-per-cent solution was injected in the temple, small nodules still persist; and where many injections were given a general diffuse but painless swelling remains. Although several hundred patients have been treated there has been no instance of an injurious effect.

[We can see no value in using paraffin, an unabsorbable substance, as an agent to carry the camphor. Its qualities retard the absorption of the camphor. This drug should be dissolved in almond oil, or olive oil, preferably the former.—ED.]

GET LEAN, AND—HOMELY.

In closing quite a lengthy article in the *Boston Medical and Surgical Journal* of June 27, 1918, DEARBORN says that a dozen or fifteen ideas and hints may be lined up to stand for a sort of fattening "system," in excessive or disliked leanness. Here they are:

1. General food-abundance. Four or five hearty meals each day, even though a hearty meal is one that disturbs for a few hours the action of the heart.

2. Fats, both animal and vegetable, in abundance: fat meats, butter, suet, cotton oil, olive oil, corn, chocolate, milk, and cream that is cream. (The cows still do produce cream, just as cattle still have sirloin steak, but we now have to take them mostly on faith.)

3. Starch: Grains, breads, cakes, potatoes, vegetables, macaroni, tapioca.

4. Sugar. One of the curious things about the food-conservation propaganda is that it has not talked at all about glucose—grape-sugar. There probably are millions of tons of glucose made in this country every year, and with a mixed diet for most folks it is, in reasonable amounts, a perfectly wholesome food. It is about four-fifths as sweet as cane-sugar, and could be sold at retail for about 3 cents per pound. Why the use of that great supply of nutritious sweetening has not been suggested, Dearborn says he cannot tell. The reason, he believes, is largely a psychological one: there is a prejudice of long standing against glucose, but more against the name

than the sugar. Glucose (grape-sugar), corn syrup, sorghum (Chinese sugar-cane), syrup, honey.

Chocolate combines fat, and usually sugar, with a large per cent of protein, and therefore is very concentrated nourishment. Chocolate (40 cents per pound) is worth five times as much, so far as energy is concerned, as rump steak at the same price. Dates come in here, having much sugar in them.

Sugar is an instinctive food of most brutes, and therefore is "good food." Saccharin has no food value at all, and is used in cases of diabetes for sweetening where sugar cannot be allowed.

5. Breads and cereals. Starch in abundance is in all of them. Fat is found in corn-meal. Bread is the staff of life, and no slender staff either, being a complete food.

6. Storage, or underground, vegetables. Tubers, such as potatoes, turnips, beets, etc.

7. Nuts and dried fruits are important fat-producers, if properly chewed. Chestnuts, cocoanuts, walnuts, peanuts—all are inexpensive, in normal times.

8. Water, lots of it. Up to the limit unless too much laxity of bowels ensues, with meals and between.

9. Putting on fat. Abundant holiday, which is "freedom from care." Take off your soul burden of this stupendous world! Drop it and see it smash. No one can be well nourished who is "worried to death." Some of the worriers need simply a holiday, whether it be going away or even a mere change of mental attitude.

10. Indolence. Rest and sleep. Save the "sugar" in the blood and in the muscles, glycogen (starch). Cut down the outgo. Cultivate repose. Calm down. Be lazy a while.

11. Out-of-door life. Enough to develop a good appetite and sound sleep, but not enough to use up the food too rapidly. Good digestion follows. Out-of-door life is a tonic to anabolism.

12. Advice from an expert physician, one who really understands about the internal secretions and their uses. Find one who has really and practically studied these and knows how to use them with valuable therapeutic effect—an endocrinologist.

13. If expedient, a warm climate. A region not hot, but warm enough to encourage and allow the accumulation of body fat. Five minutes in a cold bath is enough completely to burn up the glycogen and "start" the destruction of the body-fat.

Dearborn thinks these statements may prove to be the "lucky thirteen" for some people.

FACTS AND FANCIES ABOUT TONSILS.

More than once we have quoted what SWAIN has to say about tonsils. In the *Medical Record* of June 22, 1918, he says that the conservative remarks by various men bring him to believe as follows:

First, inasmuch as many tonsils require removal, when this is necessary there is no way as good nor anywhere nearly as satisfactory from every standpoint as tonsillectomy. When possible he uses the Sluder-Beck method as developed by Sperry.

Secondly, by preference, whenever he can, he proves the necessity for graver procedures by first trying the more conservative. By this latter he often succeeds, and he thinks it only fair to infirm, or delicate, or timid folks to do the easiest way for them. They have a right not to be dragged through the more serious ordeal when it is unnecessary.

Thirdly, in children, especially under six or eight, one should be just as thorough as is possible—if necessary reoperating, in order to get rid of all the adenoid or third tonsil. Unless very large, or the cause of much trouble, the faucials are allowed to remain. When the child is under the anesthetic, some operators always remove the tonsils when operating for adenoids. By simply seeing that the plica is freed from the tonsil, and the tonsil from adhesion to the pillar, small unsuspected tonsils can certainly quite safely be allowed to remain and do some good to the growing child.

Fourthly, every tonsil worthy of the

name will at some time have thick white cheesy matter in its crypts, large ones almost always. This will almost always squeeze out when the tonsil is snared out in operation; quite generally it appears when a tonsil is squeezed by a spud or by the edge of a tongue depressor. To accept this as the criterion for operation means that you must remove every tonsil, for as we have just said this probably happens at some time to every tonsil. Simply slitting up a crypt or two or punching out the partitions between them will remove this tendency to accumulate and, therefore, one indication for tonsillectomy. If accumulation continues, remove; but to say that because once or twice a year a simple sore throat occurs, or a bit of accumulation is found that often, is not to his mind a logical indication for removal *in toto*.

Fifthly, it would seem only fair to think that we all (and this whole paper is written in no "holier than thou" spirit, for any error here defined has been also laid at his own door) ought to remember and explain to our patients—and this applies alike to internist, surgeon, and specialist—that too much must not be promised or expected as a result of the tonsillar operation, for otherwise we greatly mar the splendid work done in our own circle and elsewhere to perfect the operation of tonsillectomy, doing thereby a great injustice.

THE KARELL TREATMENT FOR DROPSIES AND CERTAIN OTHER CONDITIONS.

BULLOWA in *American Medicine* for June, 1918, reminds us that Karell recommended the sipping of two to six ounces (60 to 200 grammes) of skimmed milk at eight o'clock in the morning, at noon, at four and at eight P.M. This is to the exclusion of all other food and drink. He explicitly cautions against any laxity in directions and warns against simply ordering milk diet. Success does not attend a doctor who merely says: "Drink milk when you wish and as much as you like." This diet is continued for five or six weeks with the following modifications: Extreme thirst is relieved with plain water or seltzer, and after the second or third week a little stale white bread with salt or morsel of salt herring is given with the morning milk, and some stale bread at noon. At times oatmeal gruel is substituted for the milk. Constipation is treated by offering stewed prunes or a baked apple. Castor oil and rhubarb or plain water enemata are sometimes employed.

As Bullowa has seen the method employed in the hospitals of New York City, the directions are those given by L. Jacob. His practice is that of Lenhartz. Their directions follow: 200 Cc. of raw milk, warmed to taste, are given four times a day at eight, twelve, four, and eight for five to seven days. In the next two to six days the diet is augmented by an egg at ten A.M. and some zwieback at six P.M. Later two eggs are given, then vegetables. Gradually rice with milk or tea is substituted for the milk. By the twelfth day the diet has been so increased that the patient receives a full diet with the single restriction that the total fluid intake shall not exceed 800 Cc. in twenty-four hours.

Jacob insists that absolute bed rest is a cardinal part of the treatment. Karell does not insist upon this, nor has he found it necessary with many patients. Accordingly they may be treated ambulant, either with a strict Karell or with modifications which an understanding of the fundamental principles allows. He has frequently, from the outset, permitted patients to add one-half of a banana or some puffed rice to the milk. It seems to give them comfort without detracting materially from the results. Possibly it assists them to persevere in the treatment. Before proceeding to give a list of the conditions in which Karell's treatment may be employed advantageously, Bullowa describes the usual result of instituting the diet and seeks to explain the phenomena.

After a latent period of from two to three days, occasionally less and at times more prolonged, during which there has been a slight increase, there occurs a sudden very

marked increase in the volume of urine. This may even be as much as eight or ten times what has been excreted during twenty-four hours before commencing the treatment. The urine excreted is lower in specific gravity than at the outset. The marked diuresis continues a varying period, depending on the amount of precedent edema, until all evidence of anasarca or effusion is gone. If the diuresis has been definitely initiated, it does not seem to matter whether the diet, as outlined by Karell, is strictly adhered to or not. The urine continues abundant until the patient has lost from twelve to thirty pounds in weight. This may take one day or several days. There is usually a marked fall in blood-pressure, frequently as much as thirty, forty, or sixty millimeters of mercury, though at times the blood-pressure rises when it has previously been too low. There is always a very great subjective improvement in respect to dizziness, free breathing, sleep, and what the patients term clear-headedness. This is frequently manifest before the marked diuresis appears. On this point all writers agree, and it has been his own experience.

The critical onset of improvement does not seem to him to have been sufficiently emphasized by his predecessors in this field, and on this account it is possible that they have failed in explaining the result.

The benefit has been attributed to the rest in bed and improved renal perfusion, by reason of the reduction of the work required from the heart. This is accounted for by bed rest and diminished fluid. Secondly, it has been charged to the low salt content of the diet.

That the benefit is not due to the rest in bed is evident from the fact that it may accrue when the patient remains up and about. The marked diuresis is certainly not due to the improved circulation, because when the circulation is at its best and compensation has been restored the volume of urine falls and the specific gravity rises even though the blood-pressure may be optimal for urine excretion. That it is not entirely due to the limitation of fluid was shown by Fernand Widal, who nullified its benefit by adding sufficient salt to a milk diet, and conversely his achloride diet frequently caused the disappearance of dropsy when there was no diminution of the fluid intake. Widal recognized the paramount importance of drink restriction and frequently reduced the fluid intake to 500 Cc. a day. Bullowa wishes to emphasize the fact that Widal's achloride diet may contain as much as 400 grammes of meat, 500 grammes salt-free bread, and 1000 grammes of potato. This large quantity of protein and starch is a very important element of his diet, a fact which Epstein has recently sought to make use of in what he terms his "high protein diet."

CEREBROSPINAL FEVER.

Writing on this topic in the *Edinburgh Medical Journal* for June, 1918, MacLagan directs that before the administration of the serum the subarachnoid space is drained as completely as possible by means of lumbar puncture, and the serum is introduced by the gravity method with as low a head of pressure as possible, usually 3 or 4 inches is sufficient. There appears to be no risk attached to the removal of large quantities of cerebrospinal fluid; up to 120 Cc. have commonly been removed, and the usual amount is about 60 Cc. This operation is performed daily until there is great improvement in the symptoms and until the cerebrospinal fluid is clear, or until six or seven doses have been given.

After this period there appears to be considerable risk of sudden respiratory failure attached to the injection of serum, no matter how carefully performed, and also a certain risk of the occurrence of the phenomenon of anaphylaxis. These risks are hardly worth running, as by this time the acuteness of the infection is probably overcome, and the patient is producing sufficient antibodies of his own. The main indication now is to prevent the establishment of an internal hydrocephalus, and this is best met by frequent simple lumbar puncture. Accumulation of cerebrospinal fluid must be prevented until such time as the normal

formation and absorption are reëstablished. The indications for lumbar puncture at this stage are headache, rise of temperature, and vomiting. These symptoms are at once relieved by simple lumbar puncture, so long as the communication between the interventricular system and the subarachnoid space remains patent.

Believing strongly as he does in the part played by a general infection in cerebrospinal fever, he also injects about 30 Cc. serum intramuscularly, and believes that the results obtained justify this procedure. With the exception of those fulminant cases in which fatal lesions of the adrenal glands are produced before treatment can have any effect, no case now dies from the severity of the infectious process. Death is either due to a complicating pneumonia, etc., or after a more or less prolonged illness to the establishment of internal hydrocephalus. The result is, he thinks, certainly due to the treatment employed, and if a serum could be produced of a higher antitoxic content and more specific to the various types of meningococcus met with in this epidemic, we might expect even greater results.

Recently in fulmination cases he has been employing intramuscular injections of liq. adrenalin hydrochlor., 1 to 1000, in doses of 10 minims. This is an attempt to replace the internal secretion of the damaged adrenal medulla, in the hope that it may be able to resume function. This appears to be a promising line of treatment, as in several extremely severe cases the pulse at the wrist has returned, and two or three of his latest cases of this type have recovered. These were all cases which one would have thought to be of an inevitably fatal type. In all fulminating cases, with an extensive purpuric rash and failure of the peripheral circulation, the intramuscular injection of adrenalin is worthy of trial.

In the type of case in which the cerebrospinal fluid becomes so thick and purulent that it will not flow through even the largest lumbar puncture needle, the manner of treatment must be modified. As only small quantities of fluid can be abstracted, and as the injection of serum into the subarachnoid space under pressure is highly dangerous, we must be content with the introduction of small doses more frequently, combined with the intramuscular injection. In this way we hope to render the exudate more fluid, but the treatment of these cases is very discouraging.

"BUDDEIZED" MILK.

In *American Medicine* for June, 1918, HEWLETT points out that some years ago a method of treating milk was introduced by Budde, a Danish engineer, which was claimed to attain the result desired, without any of the objectionable features of other systems of milk treatment. This method makes use of the well-known germicidal power of hydrogen peroxide. The principle of this process is as follows:

The milk is obtained in as cleanly a condition as possible, and if it has to be kept for any time before treatment it is efficiently chilled, but preferably it is treated soon after milking. A proper proportion of peroxide of hydrogen is added to the milk and the mixture is heated to 51° to 52° C. for at least three hours. A temperature below 48° C. is not efficient, and one above 55° C. should be avoided, as this tends to induce changes in the milk. With the aid of this heating the hydrogen peroxide is completely decomposed into water and oxygen by an enzyme (catalase) present in the milk, and the oxygen at the moment of liberation being in a nascent condition acts as an efficient germicide. At the end of the process the whole of the hydrogen peroxide should have been decomposed, provided the right proportion has been made to the milk, while the majority of microörganisms have been destroyed. The amount of hydrogen peroxide required to obtain this result is about 15 Cc. of a three-percent solution per liter of milk. The milk is treated in bulk, immediately bottled with suitable precautions, and thus supplied to the public. The milk so treated is practically unaltered in appearance and flavor, the cream rises as usual, but all the ordinary

non-sporing pathogenic germs are destroyed and the milk will keep sweet for at least eight or ten days.

The capacity of natural milk to decompose hydrogen peroxide varies, presumably on account of variation in the catalase content of milk from different cows, from different localities, etc. With some of the continental milk, less than 15 Cc. of the 3-per-cent peroxide can be decomposed, and it is necessary in such cases to add something, *e.g.*, small quantities of yeast enzymes, which will decompose the excess of peroxide and render the treated product free from this agent. English milk, however, will generally decompose on an average 17 Cc. of the peroxide per liter, while in America some of our milk will do even better. It is seldom necessary in treating the milk of England or America to add the yeast enzymes, and the milk itself will completely decompose the requisite quantity of hydrogen peroxide. But even should a small amount of the peroxide remain undecomposed, it can hardly be deleterious, for at most the amount will be infinitesimal. He is confident that these small quantities of pure peroxide are quite harmless, since they will be immediately decomposed in the stomach.

The enzyme "catalase" has been described by O. Loew, while the interaction between various enzymes and hydrogen peroxide has been investigated by Vanderwelde, Waele, and Sugg. Practically the only question is whether or not the Budde process alters the nutritive qualities of the milk. Relative to this he has made no personal investigation, but Lindman states as the result of an extensive use of "Buddeized" milk in cases of diarrhea and digestive disturbance that it can be used with the greatest benefit in these conditions.

Some years ago he made a number of bacteriologic experiments with milk treated by the Budde process. He found that all the non-sporing organisms dealt with, pathogenic and non-pathogenic, were destroyed by the process. They included B. tuberculosis, B. diphtheriæ, B. typhosus, B. paratyphosus, B. coli, Vibrio choleræ, B. dysenteriæ, M. pyogenes aureus, and B. acidi lactici. Sporing forms, such as B. anthracis, B. subtilis, and Penicillium glaucum, were not destroyed by the process though appreciably reduced in number.

Buddeized milk is practically indistinguishable from fresh, untreated milk in taste, odor, appearance, or in the rising of the cream, and has the great advantage that it will keep sweet in hot weather for several days longer than untreated milk.

PARAFFIN OIL AS A MEDICINE.

In the *Bulletin of Pharmacy* for July, 1918, ERICHSEN states that the therapeutic scope of petroleum oil, according to the fifteenth edition of the United States Dispensatory, is rather comprehensive. It refers to the remedy as "a stimulating antispasmodic, expectorant, and diaphoretic," and suggests that "it is a valuable alterative. Digestion becomes improved under its use. The appetite is increased. Loss of weight is often arrested. It is antiphlogistic. It quiets the irritable heart and lessens vascular congestion. By some it is claimed to be antiseptic; at least, it is aseptic." Erichsen declares that these assertions are altogether too sweeping and have not been borne out by professional experience. The same statement applies to the contention that the oil of petroleum is a remedy for tuberculosis, although Lane pointed out that tuberculosis cannot obtain a foothold unless the tissues of the body are depreciated by autointoxication.

While an oil of this character is not unpleasant to take, because it is tasteless, some people seem to find it difficult to ingest oils of any kind. In such instances the addition of some aromatic black cherry liqueur, or a syrup of raspberry or blackberry, may be recommended.

An oil of this kind for internal use should be free from unsaturated hydrocarbons—a very important point. Add a little iodine. If the iodine gives no color—fades into the oil and loses its violet tinge—the product may cause internal disturbances, as unsaturated hydrocarbons are present.

TONSIL OPERATIONS.

The *Medical Record* of July 27, 1917, expresses the belief that it is a healthful sign of progress that tonsil operations are no longer lightly undertaken, and that there is a keen understanding of the dangers that go with these operations. Tonsil operations are now justly given the same weight as major operations. According to some observers about one-third of the cases of suppuration of the lungs are directly traceable to tonsil operations; and this complication is by no means the only eventuality to be dreaded. But it is not to be wondered at that suppuration is common after removal of the tonsil when it is remembered that this operation must be undertaken in an open septic field with no possibility for maintaining aseptic conditions. The operation of enucleation of the tonsil has helped to reduce the area of infection over the area produced by mere cutting through the tonsil as is done in tonsillotomy.

At best the operation is a bloody one. The hemorrhage is too frequently left to itself, and only when it is marked and dangerous is there any attempt made to control it. There can be no provision made for catching the blood that flows from the field of operation, and it is allowed to run whither it will. In adults with hard fibrous tonsils the blood-vessels stay agape and the hemorrhage is very likely to be more severe than in children. When general anesthesia is employed there is very little ability to expel blood that enters the respiratory passages, and the blood with its load of organisms is very apt to find lodgment in the bronchi to set up suppurative processes. Moreover, the gaping blood-vessels of the peritonsillar tissues encourage primary embolism of the veins. The emboli find their way directly through the right heart. The same result may be achieved by phlebitis in the peritonsillar vessels, and secondary embolism following the same lines as in primary embolism.

Improved methods of anesthesia and more refined technique of operation reduce much of the danger, but not all by any means. Although general anesthesia adds to the dangers of tonsil operations, nothing but general anesthesia can be used in children or in adults of nervous disposition. Much of the aspiration effects following upon the hemorrhage would be obviated by the use of a local anesthetic but for the fact that it is impossible to gauge accurately the amount of the anesthetic absorbed. Local anesthesia is very treacherous in its action, and fatal outcomes are not uncommon with it.

On the whole the question of operating at all, the kind of operations, and the form of anesthesia must be decided according to the individual variations, and no rule can be laid down to cover all cases. But in all cases the tonsil operations deserve a great deal more caution in their execution than is still accorded them. The danger is so real and the outcome so uncertain that it has been recommended, at least for adults, that the tonsil be destroyed with the high-frequency spark, at several sittings. In such cases there is little reaction, little inconvenience, and little danger. None of the dangers in tonsil operations should, however, prevent their execution where necessary. All surgical operations have an element of danger, but the danger will be reduced by a proper conception of the gravity of the operation, and will stimulate improvements therein.

THE TREATMENT OF SEVERE RELAPSING CASES OF MALARIA.

Gunson and three associates make a report on this subject in the *Lancet* of June 22, 1918. They reach these views:

1. A considerable number of patients suffering from severe malaria—amounting in one series of 328 cases to 30 per cent of the total number under treatment at one period—when treated by oral quinine continue to relapse, develop long periods of sustained pyrexia, or become increasingly cachectic.

2. A group of 90 successive patients of this type were treated by two intensive courses of quinine (intramuscular gr. 20, oral gr. 20; intramuscular gr. 20 daily for

four days, the course being repeated ten days later). The result of such treatment was an immediate, progressive, and marked improvement in the general condition in all cases. Relapses occurred in 44 per cent of cases within four weeks, but were of considerably less severity than previously and were completely controlled by oral quinine.

3. Another series of 552 relapsing cases, less severe in type, were treated, during the apyrexic period, by three different methods:

A. 368 were given no quinine; of these, 46 per cent relapsed within three weeks.

B. 94 were given quinine gr. 20 on Saturdays and Sundays; of these 10 per cent relapsed within three weeks.

C. 90 were given quinine gr. 20 daily; of these 8 per cent relapsed within three weeks.

1. Routine treatment by oral quinine is adequate in the majority of cases of relapsing malaria; it is necessary to continue the quinine treatment in doses of 20 gr. either daily or twice weekly during the patient's stay in the hospital to obviate a high incidence of relapses.

2. In the cases (the minority) in which oral quinine proves inadequate, intensive treatment by one or more courses of combined oral and intramuscular quinine (gr. 60 daily for four days) is followed by such marked improvement as to justify the adoption of this treatment as a routine procedure for such cases, the chief indication for this course being progressive cachexia and visceral enlargement in a patient suffering from repeated relapses or prolonged pyrexia and not responding to oral quinine.

THE CIRCULATION OF ARSENIC IN THE CEREBROSPINAL FLUID.

In the *Journal of the American Medical Association* of July 6, 1918, RIEGER and SOLOMON conclude as follows:

1. Of 123 cerebrospinal fluids collected at intervals ranging from five minutes to twenty-three hours after intravenous injection of from 0.3 to 0.6 gm. of arsphenamin, thirty-eight showed appreciable amounts of arsenic.

2. The largest amount found was 0.6 mg. of arsenous oxide in 1 Cc. The average amount was 0.18 mg. per cubic centimeter. The shortest interval at which arsenic was found was thirty minutes; the longest two hours.

3. With successive injections, the fluids in general show progressively smaller amounts of arsenic for the same time interval.

4. In general, those patients consistently showing the larger amounts of arsenic in their fluids made the more rapid improvement.

5. It is suggested that intravenous injections of divided doses at one- or two-hour intervals would prove more effective in maintaining a high concentration of arsphenamin in the blood for longer periods, and thus possibly allow increasingly greater amounts to pass into the perivascular spaces.

THE SIN OF TREATING SYMPTOMS.

In the *Journal of the American Medical Association* of July 6, 1918, WARD writes as follows:

The real physician, the one who has only the good of his patient in mind, never fears Roentgen-ray findings, laboratory results, dental examination, or specialists' reports. The specialist is with us to stay, and is most useful, but he must not be permitted to subsidize the whole patient to aggrandize the disease of one particular organ.

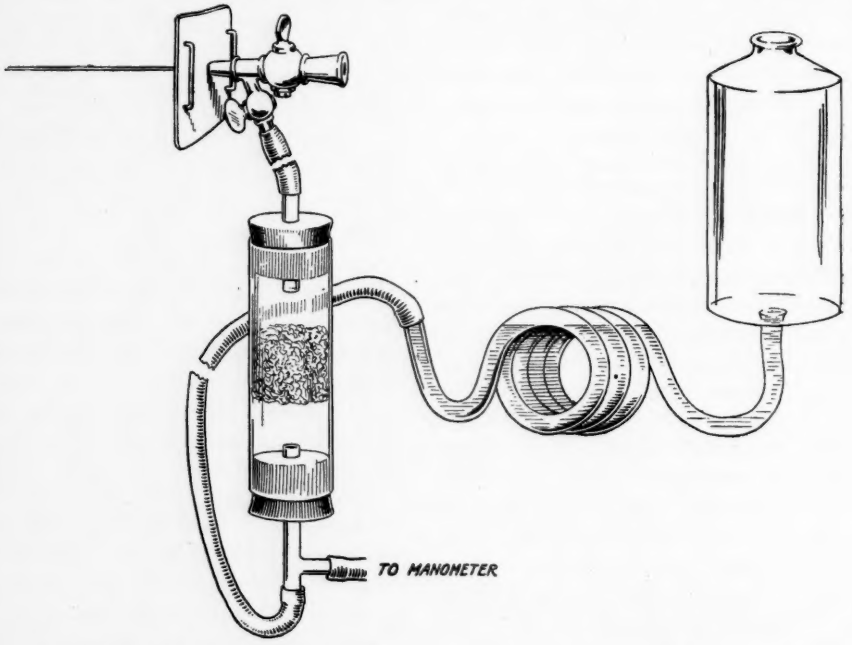
The clinician must not allow the laboratory or the specialists to make his diagnosis; if so, his days of usefulness are gone. These factors are only aids. One cannot always delay until the pathognomonic symptom appears. One who waits for the laboratory diagnosis of pulmonary tuberculosis will realize that he has waited too long to be of real value to his patient. The patient must be viewed as a whole, the laboratory and specialists' findings being subsidiary to one grand summing up. Who shall weigh these findings in the balance and be final arbiter? The one who should be most capable is the practitioner or internist.

THE TREATMENT OF PNEUMOTHORAX COMPLICATING TUBERCULOSIS.

In an article by DAVIES, in the *Quarterly Journal of Medicine* for April (just received), he gives this advice as to the treatment of ingravescent pneumothorax. If the symptons are urgent and threatening the life of the patient, instant relief can be obtained by passing a large-sized hypodermic needle through the chest-wall. This needle is fixed in position by thread and strapping, and the outer end should be covered with a few layers of sterilized gauze.

When the symptons are less acute it is possible, while allowing for the escape of the excess of air in the pleural cavity, to maintain a constant slight positive intrapleural pressure. This is particularly desirable as, unless the opening in the lung closes soon after the rupture and is prevented from being repeatedly reopened by the exertion of coughing, there is the danger of a permanent fistula resulting. The method of regulating the pressure is as follows:

If the needle which passes through the chest-wall is connected by tubing to a Wolff bottle partly filled with water, the depth of the opening of the tubing below the surface of the fluid can be altered so that the gas will escape whenever the intrapleural pressure exceeds the required maximum; this should be equal to about 5 mm. of mercury. It will be found, however, that a cough raises the pressure considerably above this. With each cough there will be an escape of gas, and if the opening in the lung has closed, the intrapleural pressure will become



progressively less positive and then more negative. To obviate this, the Wolff bottle must be replaced by a horizontal spiral of some four turns of narrow glass tubing, the distal end of which opens into the base of a broad cylindrical receiver. The spiral coils should be 1½ inches in diameter. The receiver must be broad, so that when the fluid is displaced into it from the spiral tubing the depth of water is not increased more than half an inch. Above, it is in direct communication with the open air; the spiral and receiver must be below the level of the patient. The intrapleural pressure

is regulated by the extent to which these are filled with water. The water in the succession of loops of tubing prevents the escape of gas when the pressure in the pleural cavity is momentarily, even though considerably, raised by acts such as sneezing and coughing. When, however, there is a steady rise of pressure, the water is displaced from the spiral into the receiver and gas escapes until the intrapleural pressure is again equal to the height of the column of water (see illustration).

In conclusion, a word must be said on the advisability of carrying out the operative treatment for pulmonary tuberculosis in sanatoria as opposed to hospitals or nursing homes. A considerable experience of both enables Davies to assert without hesitation the desirability of the former, provided always that the necessary facilities are available. The results obtained in hospitals and nursing homes may be extremely gratifying, but one is often hampered by the inability to give to the patient those advantages which are to be obtained in a fully equipped sanatorium only. Nitrogen displacement need scarcely interfere with the special routine of sanatorium life, and if the *x*-rays are available, as they always should be, the treatment can be carried out under complete control.

The time required for the operations and for the immediate convalescence when rib mobilization is done is about eight weeks. It is an inestimable advantage to the patient if that time can be spent away from the stagnant and depressing atmosphere of a town, in a sanatorium where the air is fresher, the outlook more extensive, and the patient, when sufficiently recovered, can be wheeled from his room into the grounds. For it to be possible for these operations to be done in a sanatorium, however, the place must be properly equipped, and nurses competent for the care of surgical cases must be available.

At present the importance, and even the necessity, for the closest alliance between surgery and medicine in the treatment of pulmonary tuberculosis has not been appreciated. When this comes to pass, the equipment of a modern sanatorium will include facilities for radiography and for operative treatment.

THE INFLUENCE OF TUBERCULIN TREATMENT.

BARDSWELL in the *Lancet* of June, 1918, in the course of an article on this subject says it has been claimed that when tuberculin is given in addition to the usual hygienic measures employed at a sanatorium the probability of T. B. disappearing from the sputum is increased. He does not think that any influence of tuberculin can be discovered in the Midhurst records. The percentage figures for the two years during which tuberculin was so largely used, namely, 1912-13 and 1913-14, are practically the same as the records for two years subsequent to this period, namely, 1915-16 and 1916-17, during which tuberculin was not employed at all.

THE CHOICE OF ANESTHETICS AND THE TECHNIQUE OF GAS-OXYGEN ANESTHESIA.

In the *Chicago Medical Recorder* for June, 1918, LITTLETON claims that nitrous oxide can be used in nearly every case, and that it is ideal in children. Of course, this can only be done with a light-pressure machine, because it is very easy for children to breathe if the pressure of the nitrous oxide and oxygen is low. In pulmonary cases rebreathing is very beneficial. It stimulates the patients, and they are better when they come off the operating table than when they go on.

Types of patients for nitrous oxide: Hysterical patients, alcoholics, outdoor men, athletes, foreigners and youths usually need a small amount of ether for induction. If you give a patient nitrous oxide for, say, from five to seven minutes and you find that he is not going to sleep, it is better to give him a little ether for induction, get him under control, and then decrease ether gradually. He does not realize that he has had it.

Red-haired people are very hard to manage. They are not dependable, and you really never know just what they are going to do.

Blondes usually are rigid and induction is longer.

Negroes, because of their color, are not good risks, and in the South they have been given ether entirely. Littleton did not try to give them nitrous oxide. One of those who tried the gas in negroes had two fatalities the first week, so he decided that as ether did not hurt them, it was the safest anesthetic for this class of patients.

Little, thin, wiry patients take very little anesthetic and they make ideal recoveries.

Large, fat patients usually go into shock, take much anesthetic, and are usually nauseated—not good risks.

In a secondary operation the patient who has previously had ether is usually quite hard to manage. One finds it is much easier to give a second gas-oxygen than to give gas-oxygen after the patient has had ether.

Then there is the person who has made his will and has made up his mind to die. Usually we find he is the sort of man who cannot be relaxed. His muscles contract. He is hard to operate upon. He is the sort of man who has a lot of postoperative gas pains and needs a lot of postoperative treatment.

They had a series of children come down with hysterical mothers; three or four of them he thinks were Jewish mothers. They took the temperature of the mothers in the morning when they came in and again when the child was being operated on, and they found a rise of two or three degrees in their temperature.

Then they have the case that comes to the operating-room and goes to sleep without any trouble. Usually they have had no food or water. It is really ideal and the anesthetic is easy to give.

Doctors and nurses are very hard to manage, either because they know too much about it or lack confidence in the anesthetist.

Goitre cases are in a class by themselves. They must be handled with the greatest care. In exophthalmic goitre, start in with a little anesthetic in the patient's room, increasing each day until it is found they can stand taking an anesthetic. These cases should be given a preliminary hypodermic injection one hour before going to the operating-room and have it repeated just before the operation. They should never have ether even for relaxation. Local anesthesia does much to help in these cases.

Kidney cases, gastroenterostomies, appendices, hernias, amputations, resections, vaginal hysterectomies, drainage of gallbladder, may be done without ether. Of course, in all these cases local anesthesia helps very much.

The average case having gas-oxygen does not have nausea, does not have gas pains, takes water immediately, sometimes takes food the same day and usually the second day. This is a great saving to the nursing staff, a saving to the doctor, and a general saving to all concerned.

The time has come when the laity will demand gas-oxygen, and the modern hospital must give it to them. The cost is very little. But anesthetics to-day cannot be given by a novice. They require some one who is well trained, a person who will concentrate his own powers and give to each patient an individual anesthetic.

THE CURATIVE AND PROPHYLACTIC VALUE OF VACCINES IN PERTUSSIS.

An important paper on this topic is contributed by BARENBERG to the *American Journal of Diseases of Children* for July, 1918. He says that as a result of the use of vaccines in an epidemic of pertussis he is led to about the same conclusions which Hess reached in 1914 following a similar therapeutic test. It would seem almost certain that pertussis vaccine, given even in large dosage, not only has no curative effect, but does not tend to lessen the severity of the disease. The experience of these two epidemics can be interpreted only in this way.

As regards the prophylactic value of pertussis vaccine, the case is different. In both the former epidemics and in this one the percentage of vaccinated children who developed the disease was considerably less than of those who were not vaccinated. If we draw conclusions from our own results we must, therefore, attribute to the vaccine some prophylactic potency.

We wish to emphasize the fact that in this study it was possible, for the first time, to vaccinate children some weeks before they came in contact with the cases of pertussis, and that therefore there was no chance of their having been in the incubation stage at the time prophylactic therapy was instituted.

THE USE OF NITROUS OXIDE IN THE PRODUCTION OF PAINLESS CHILDBIRTH.

To the *Ohio State Medical Journal* of July 1, 1918, SALZER contributes a paper on this topic.

Of the various means at our disposal for the production of painless childbirth, he believes nitrous oxide stands alone in that it is without danger to both mother and child, it can be used at any stage of labor, its use can be kept up practically indefinitely, it does not retard labor—in fact, it seems to accelerate it—and, unlike hypodermic medication, its effects are under absolute control at all times. It does not give us blue babies nor maniacal mothers. There are no after-effects of any kind to be feared.

Salzer asks: Why is it then that this agent is not more frequently used? One reason for this condition of affairs may lie in the fact that the number of detailed case reports in the literature are few. He therefore reports at length several cases. Another reason may be, that through the literature alone the obstetrician cannot familiarize himself with the necessary appliances and their uses. Furthermore, the use of nitrous oxide in obstetrics may be thought to be attended with the same danger, difficulties of administration and expense as in general surgery; but such is not the case. Insensitiveness to pain, and that alone, is the prime object of its use in obstetrics, while in surgery more or less relaxation must be obtained. It is this endeavor to produce satisfactory relaxation that taxes the skill of the anesthetist, is attended with danger, and on account of the large quantities of gas and oxygen used, makes it an expensive anesthetic.

The technique of administration is simple and is fundamentally the same in all types of apparatus used. We must give enough nitrous oxide to relieve the pain and enough air or oxygen to prevent cyanosis.

In the early stages of labor when the pains are several minutes apart and the patient is comfortable between pains, it is necessary to give only a few breaths of nitrous oxide at the beginning of each pain, just enough to ease the pain without causing loss of consciousness. Salzer does not find it necessary, nor desirable, at this stage to use either air or oxygen in connection with the gas. A few pains will quickly determine just how much gas to use. He prefers to have the patient hold the mask herself, as it gives her something to do, and besides, if she should lose consciousness she will either drop or displace the mask, so that she will then breathe air and recover consciousness. In the event that the patient will not hold the mask any one present can hold it for her.

A mask which covers both mouth and nose has, in his experience, proved more satisfactory than a nasal inhaler, as some women cannot, or will not, keep their mouths shut and will as a consequence breathe too much air and too little gas for satisfactory results.

When the end of labor approaches and the pains begin to pile up, as it were, and especially as the head passes over the perineum, it then becomes necessary to administer the nitrous oxide more or less continuously, and, of course, air, or pure oxygen, must be added in sufficient quantity to prevent cyanosis and consequent asphyxia. Salzer purposely avoids any mention as to the percentage of air or oxygen

that must be added, as he feels that some of the accidents in major surgery due to nitrous-oxide anesthesia have occurred because the anesthetist paid more attention to the gauges on the machine than to the patient. He therefore repeats: use enough air or oxygen in connection with the gas to prevent cyanosis. He wants to emphasize the fact that cyanosis is never due to too much nitrous oxide, but is due to the exclusion of oxygen.

In the majority of normal cases the use of air in connection with the gas will be all that is necessary, but more uniformly successful results will be obtained if oxygen is used. If the case is a complicated one and deep anesthesia is required, it will be absolutely necessary to use oxygen to prevent cyanosis. In one case, however, an occipito-posterior case, the obstetrician was able to do a manual rotation of the head, and although nitrous oxide and air was used, the woman suffered no pain. The patient was a primipara and the whole hand was introduced into the vagina.

It is not desired, nor is it necessary, as a rule, especially in the early stages, to have the patient lose consciousness, although momentary loss of consciousness does no harm and is very often welcomed by the patient. Nitrous oxide (laughing-gas) usually tends to put the woman in a happy frame of mind, and she will sometimes laugh and joke when, without gas, she would be suffering untold agonies. She will also sometimes become very talkative and say things perhaps which had better be left unsaid. The patient always awakens at the end of the confinement, however, mentally clear. Of course, this method is appreciated best by those who have felt a few hard pains first and by multiparæ who have their previous confinements for comparison.

The fact that the labor is not retarded is a distinct advantage. In one of Salzer's early cases this fact was clearly demonstrated. The woman was having effective pains at about one-minute intervals, the head was low down and was bulging the perineum, and it seemed as if five or six more pains would terminate labor. Just at this time the gas gave out and chloroform, the only anesthetic available, was substituted. Almost immediately the interval between the pains was lengthened to five minutes, the pains became weak by comparison, and it took another hour before the head was born.

THE HEART AND ANESTHETICS.

WILLIUS in the *Journal of the American Medical Association* of July 6, 1918, says that patients whose hearts allow them to go about in comfort, or those in whom this can be effected by medical treatment, are generally considered safe for operation. In heart diseases due to focal infection, such gratifying results follow the removal of the focus that the risk of operation seems justified. Another group of cases often shows marked cardiac improvement sufficient fully to justify operation, namely, goitre, uterine fibroids, and prostatic hypertrophy. Malignancy complicated by heart disease is generally considered operable if a fair chance of recovery is offered.

In every case the decision is based on several factors: (1) the immediate operative risk; (2) the probable improvement of the heart following operation; (3) the patient's relative chance for length of life or health with or without operation; and (4) in less serious conditions, whether or not the operative relief will justify the added risk. Experience, in general, has justified the taking of risks in cases demanding surgical intervention.

It is impossible to classify cases on a basis of valvular disease alone because the true index of cardiac efficiency is myocardial quality, and this varies greatly in similar disease conditions. A classification based on cardiac reserve alone is also impossible because we have no accurate means of determining this factor, and clinical impressions are variable.

Six groups of cases have been studied: (1) auricular fibrillation; (2) auricular flutter; (3) impaired auriculoventricular conduction; (4) impaired intraventricular

conduction (arborization block); (5) mitral stenosis; and (6) aortic lesions, including valvular disease, aortitis, and dilatation (not aneurismal). These are generally recognized as bad risks or the worst risks, if angina pectoris and aneurism are excepted.

The best measure of operative risk is a good clinical impression of the patient's ability to withstand physical strain, supplemented by a careful history and a very thorough examination. Preoperative medical therapy and rest combined with surgical and medical correlation after operation is of paramount importance. The tendency is to require too great a margin of cardiac safety in surgical work. So far as the anesthesia is concerned, they have found the open drop-method of ether safe, efficient, and satisfactory. Skilfully given it does not seem to add any measurable hazard to the risk of life involved even in the handling of thyrotoxic cardiopaths.

MELANODERMA ARSENICALE PRODUCED BY CACODYLATE OF IRON.

In the *Medical Record* of June 29, 1918, MONTGOMERY reports the case of an Irishman, over seventy years of age, whom he had treated a year previously with salvarsan and mercury for an old lues. He was given the cacodylate of iron because of a profound anemia. He received nineteen doses of one grain each, given within twenty-five days, from May 11 to June 4, 1915, inclusive. At first his hemoglobin mounted quite rapidly, but came to a standstill while yet far below the normal. After taking the nineteenth dose he said he was beginning to look very dirty, although he bathed frequently. On stripping he showed characteristic arsenical, dirty, reticulated pigmentation of the skin across the lower part of the abdomen, and on the temples and forehead. The mottling or reticulation was due to lighter areas, which in some places were quite clear. The pigmentation slowly vanished on ceasing the administration of the drug. Subsequently, under the care of a friend, he was given a more rigorous course of the same drug, and developed both an alliaceous odor to his breath and characteristic cutaneous pigmentation, which again cleared up after stopping the use of the cacodylate.

There was no evident reason why the patient should be so susceptible to this particular arsenical reaction. He was anemic, he had always a trace of albumin and a few hyaline casts in his urine, and he suffered severely from sciatica. He was spare in build, active in habit, and had the pale skin usual with the northern European races, and in accordance with his age it was normally atrophic. Although the kidneys were not free from disease, yet they functionated well, and the cacodylate given produced no renal symptoms.

The above case also is interesting because a relatively non-toxic arsenical preparation, a cacodylate, had caused a marked and characteristic pigmentation of the skin in an unusually short time. The total quantity of the drug given, as before stated, was nineteen grains, or about 1.14 grammes, divided into moderate doses of one grain, or 0.06 gramme each, spread over a period of twenty-five days. That the pigmentation was due to the arsenic there was no doubt; it appeared during the administration of the drug; it disappeared on ceasing to administer it, and it reappeared on resuming this form of medication, to disappear again when the drug was discontinued.

When Montgomery first viewed the pigmentation he thought of the chloasma of anemia, because the patient was anemic, and also because chloasma occurs most frequently on the face, especially over the forehead and temples. This, however, did not account for the more marked pigmentation, definitely reticulated, over the lower part of the abdomen. Then he thought of a possible cachectic pigmentation from tuberculosis or malignant disease of the abdomen or even Addison's disease. These possibilities were all the more imminent because the persistent and severe sciatica had led him and others to a search for tumor pressure. Syphilis was another contin-

gency, pertinent, because the man undoubtedly had years before acquired the disease. Pigmentary syphilide, however, usually occurs in women, and about the neck, and is a consequence of a foregoing secondary eruption. Neither the sex, nor the situation, nor the time of this pigmentation, therefore, agreed in the present case with a possible syphilitic origin.

That the above mentioned dose of 0.06 gramme of cacodylate of iron is a moderate one may be seen by comparing it with the doses of cacodylate of sodium as formulated recently by Gougerot for subcutaneous injection:

Daily weak dose.....	0.06 to 0.08 grm.
Daily moderate dose.....	0.10 to 0.08 grm.
Bi-weekly strong dose...	0.30 to 0.40 grm.
Weekly, exceptionally strong dose.....	0.60 grm.

Theoretically the formula for cacodylate of iron is $Fe(C_2H_6AsO_2)_3$, and therefore contains three cacodyls to the cacodylate of sodium's one, but iron is so much heavier than sodium that the amount of arsenic in each is about the same. According to the above formula the cacodylate of iron should contain 48.17 per cent of the metal arsenic (As). How closely the cacodylate of iron found on the market corresponds to the theoretical formula is not known. Assuming, however, that the above is correct, this patient received nine and one-tenth grains of the metal arsenic (As) in twenty-five days.

Wm. A. Pusey has reported an instance in which a patient, seventy years of age, developed an intense pigmentation after taking, during one month, five hundred minims of Fowler's solution.

The solution of potassium arsenite does not contain 1 per cent of potassium arsenite as generally assumed, but instead the amount of potassium arsenite equivalent to 1 gramme of arsenous acid (As_2O_3) in 100 Cc. of the finished solution. On the basis of 1 gramme of As_2O_3 in 100 Cc. of Fowler's solution, 100 Cc. of Fowler's solution contains 0.757 gramme of the metal arsenic (As) and one minim of Fowler's solution contains 1/140 grain of the metal arsenic (As). Therefore five hundred minims, the quantity administered in Pusey's case, would contain 3 4/7 grains of the metal arsenic (As), an amount of the metal much less than in Montgomery's case.

The two drugs, arsenite of potassium and the cacodylate of iron, cannot, however, be compared on the basis of their arsenic content alone. The metal in some of the organic combinations is not nearly so toxic as it is in the inorganic combinations, for instance, when bound with cacodyl, as in the cacodylates, or with the benzol rings, as in salvarsan. It is also now recognized that neither of these organic combinations is so active therapeutically in cutaneous diseases as the arsenite of potassium. The interest in the present case lies in the very active effect of the cacodylate of iron in producing a pigmentation of the skin.

The by-effects of arsenic are: (1) A disagreeable granular feeling of the conjunctivæ; (2) puffiness of the lower eyelids; (3) congestion of the hands and feet; (4) dryness of the throat; (5) disturbances of the stomach; (6) diarrhea; (7) increase in the quantity of urine; (8) urticarial eruptions; (9) erythemas (for example the Jarisch-Herxheimer reaction); (10) pigmentations of the skin; and (11) hyperkeratosis, especially of the palms and soles.

Hyperpigmentation is not an infrequent consequence of the administration of arsenic when given in large doses and for considerable lengths of time. In Montgomery's experience, however, it is not nearly so frequent as irritation of the conjunctivæ and puffiness of the lower lids. Borsellini says that it occurs nearly as often as congestion of the hands and feet, and much more frequently than keratoderma of the palms and soles. Its appearance varies in different cases in its topographical distribution, in the size of the patches, and also in its intensity. There may be only a few disseminated yellow-brown patches, or there may be all the grades between this and a generalized continuous melanoderma simulating Addison's disease, and only distinguishable from it by the lack of pigmentation of the mucous membranes.

All the above by-effects are exhibitions of the physiological actions of the drug. Arsenic undoubtedly stimulates the epithelial covering of the oculorespiratory, gastrointestinal, genitourinary, and cutaneous systems, and the stimulation of such vast epithelial sheets, which are essentially gland fields spread out instead of being folded into tubes or bunched into lobuli, as in the acinous or lobulated glands, would account at least in part for the well-known tonic effects of the drug.

This stimulation, however, does not occur equally in all cases, neither as distributed throughout the vast areas above enumerated nor in individual situations. For instance, Montgomery has observed repeatedly such a small dose as one-fiftieth of a grain of arsenite of potash or of arsenous acid given three times a day causes most annoying irritation of the neck of the bladder. In the present instance reported there was marked stimulation, as far as could be ascertained, of only one function, the pigment-forming function of the skin.

RESULTS OF PROPHYLACTIC INOCULATION AGAINST PNEUMOCOCCUS IN 12,519 MEN.

CECIL and AUSTIN in the *Journal of Experimental Medicine* for June, 1918, report on this very important subject and come to the following interesting conclusions:

1. From a study of the agglutinins and protective power of the serum of 42 persons vaccinated against the pneumococcus, Types I, II, and III, it is demonstrated that a definite immune response has been secured to Types I and II by the dose of vaccine employed. Little evidence of response to Type III can be demonstrated by these methods, but this is of less significance in that in animals it is relatively difficult to secure antibodies against this strain in the serum, even though a considerable degree of active immunity may have been produced in the vaccinated animal.

2. The degree of response to the vaccination appears to be dependent upon the total dosage of each type of pneumococcus administered. While some response may be elicited by 2½ billion cocci of each type, a much more constant and greater response follows 13 billion.

3. In subcutaneous administration the manner in which the total dosage is divided, whether given in a single large dose, in seven small daily doses, or in three to five moderate doses at three- to seven-day intervals, seems to have little influence upon the degree of immune response, provided the total dosage is the same.

4. The local and general toxic reaction varies greatly in different individuals. The smaller the individual doses, the fewer are the severe reactions. This makes it desirable to divide the total dosage into as many inoculations as circumstances make practicable.

5. At Camp Upton 12,519 men have been vaccinated against Pneumococcus Types I, II, III. Three or four doses were given at intervals of five to seven days with a total dosage of 6 to 9 billion of Types I and II, and 4½ to 6 billion of Type III.

6. During the ten weeks that have elapsed since the vaccination, no cases of pneumonia of these three types have occurred among the men who had received two or more injections of vaccine.

7. In control of approximately 20,000 men there were twenty-six cases of Pneumococcus Types I, II and III pneumonias during the same period.

8. The incidence of Pneumococcus Type IV pneumonia and streptococcus pneumonia was much less among the vaccinated troops than among the unvaccinated. No explanation has been advanced for this difference.

9. Small sterile infiltrations disappearing spontaneously occasionally follow the injection of large doses of pneumococcus vaccine and appear to be an expression of cutaneous hypersusceptibility.

10. The persons who develop these lesions exhibit local reactions to each dose of vaccine. They also give abnormally marked reactions to intradermal injections of pneumotoxin. They do not, however, exhibit anything notable in the agglutina-

tive or protective powers of their sera after vaccination. Whereas the immune response is characteristically specific for the type of pneumococcus, this reaction is not specific for any type. They have found no evidence that Type III is more prone to elicit these severe local reactions than are Types I and II.

11. Prophylactic vaccination against pneumococcus of Types I, II and III is practical and apparently gives protection against pneumonia produced by these types. It remains to be determined how long this immunity persists.

EXTREMES IN INFANT FEEDING, THE PRESENT TENDENCIES.

In the *Boston Medical and Surgical Journal* of July 11, 1918, TALBOT states that the following rules may be taken as a guide to prevent extremes:

1. A new-born infant needs, roughly, about 60 calories per kilogramme of body weight; a three months' old infant from 100 to 200 calories; a six months' old infant from 90 to 100 calories; and a nine months' old infant from 70 to 90 calories.

2. The percentage composition of the food should be adapted to the digestion of the individual infant, but in no instance should more than 4 per cent of fat or 7 per cent of sugar be given. The limits of protein are rather more difficult to define, but, roughly speaking, at least 7 per cent of the food calories should be protein, and infants under four months of age, with rare exceptions, should never receive more than 1.6 per cent protein.

3. The clinical symptoms, plus the gross appearance of the stools, should be guides as to whether the food elements are digested or not. The microscopic examination of the stools in infancy is only of secondary importance in infant feeding, and should be used only to confirm other findings.

4. Finally, due consideration should be given to the balance of the food components, especially of fat and carbohydrate, in relation to protein, and care should be taken that sufficient vitamines, both fat-soluble and water-soluble, are present to insure proper growth.

IS THE AMOUNT OF CALCIUM USUALLY GIVEN IN DILUTIONS OF COW'S MILK INJURIOUS TO INFANTS?

HOLT, COURTNEY and FALES in the *American Journal of Diseases of Children* for July, 1918, as the result of a research on this subject conclude that it is yet to be demonstrated that infants fed on simple dilutions of cow's milk do not retain an adequate amount of fat, when the stools are formed or semiformed and soapy; nor do we think that a high calcium intake necessarily causes a large fat loss in the feces; while a great reduction of the calcium in the food of infants may be attended with considerable risk.

CLINICAL EXPERIENCE WITH KOGA'S CYANOCUPROL IN TUBERCULOSIS.

MASUDA and MATSUDA in the *American Journal of the Medical Sciences* for July, 1918, reach these conclusions as to a product to which we have called attention in the past year.

1. Cyanocuprol is very effective in all cases of the first stage. In the majority of cases of the second stage it is also effective. With patients of the third stage it may manifest its effect to a certain extent if favorable cases are selected and proper dosage is given.

2. The effect of cyanocuprol cannot be called strictly chemotherapeutic. It shows in some respects a strong resemblance to tuberculin.

3. The essentials of the treatment with cyanocuprol lie in finding the proper dosage for each patient. If the individualization, which is especially important with this remedy, is properly carried out its value is indeed remarkable, surpassing all other remedies ever tried.

4. The combination of calcium prevents

violent reactions and does not affect the efficacy of the drug.

5. The combination of immune therapy and sanatorium treatment is necessary.

6. The question of the duration of the treatment is an important one. According to their own experience if the patient is not improved after two or three injections, or is weakened, the dosage should be reduced or the interval extended. If this brings no improvement the treatment must be given up. Even in favorable cases, when the results are good after each injection, the treatment is best interrupted between the fifth and sixth and eleventh and twelfth injections, for at these times the condition is most improved. If treatment is continued in such cases there will be no benefit from it; instead there may be a return of previous symptoms and the patient's condition may become hopeless.

EAR DISEASES OF CHILDREN.

BOEBINGER in the *New Orleans Medical and Surgical Journal* for July, 1918, gives these directions for preparation for paracentesis: Cleanse auricle; the external meatus is cleansed with H_2O_2, alcohol, and boric acid irrigation, etc. If the patient is an infant, no anesthesia is necessary, but in older children equal parts of cocaine, menthol, phenol, as ear drops, usually suffice as an anodyne. Ethyl chloride is most excellent and is comparatively safe; ether is sometimes used.

Some authors recommend the injection of a Schleich and adrenalin mixture into the tympanic cavity. The operation should be done under aseptic precautions, to avoid the danger of secondary infection. If paracentesis is done at the proper time it will be followed immediately by a serohemorrhagic or a hemorrhagico-purulent exudate. Immediate evacuation of pus shows that the operation was done too late, that the inflammatory exudate has been completely transformed into pus, and that all middle-ear spaces are replete wih pus.

Never dry or syringe, but place sterile gauze strips into canal, plug up outer canal with cotton, and change often. In favorable cases there is profuse purulent discharge in the course of the next few hours. The fever gradually recedes to normal; the pain disappears completely a few hours after paracentesis. If the above fails to give relief, it is possible we are having faulty drainage or complications.

Almost any kind of a knife will suffice in the hands of an experienced surgeon. The curved one is perhaps better, in order to have a clear view. The style of incision is from above downward, from below upward, following the posterior curve of the drum membrane. The author recommends the incision along the floor of the middle ear, as this is the most dependent portion of the tympanic cavity, also being nearer the trouble-maker (Eustachian tube) and avoiding the severing of the chorda tympani nerve. Of course, when we have typical bulging to deal with we cannot select our spot.

In discussing the paper of Boebinger, PATTON expressed the belief that the most important thing in doing ear work is to see. We may be told what to do and how to do it, but can we do it? The opening of the ear-drum is not a simple matter. He has opened many ear-drums, and there are some ear-drums that he found very hard to open. Take a child, and it is a comparatively simple matter to open the drum. On the other hand, if one takes a baby six months old, even the specialist will have a hard time in finding the ear-drum, and more damage is done in trying to open the ear-drum unless one can see, and he ventures to say in 80 per cent of such cases one will not open the drum. If we consider the anatomy of the child we will find that the posterior canal goes straight in, and the ear-drum is a continuation of the posterior canal. If we stick a knife in the infant's ear we should be able to see the opening with the head mirror, but if a head mirror is not used we must see that the rays of light are focusing on that ear-drum, or we cannot see it at all, and will not be able to

treat the ear-drum unless it can be seen. With the knife the opening is made in the posterior canal; we get bleeding, the temperature does not drop, and the patient gets no relief. This is not infrequently done by specialists.

In regard to anesthesia: In patients up to one or two years of age he hardly ever uses a local or general anesthetic; but take a child two years of age that is obstreperous, and it is a different proposition. Five people can hardly hold a two-year-old child from moving, and on two separate occasions he has seen local anesthesia used in such cases. In one case in which no anesthesia was used an attempt was made to open the ear-drum, and the child jumped to such an extent that the external canal was slit right open. We must remember how close we are to the brain and jugular and carotid when we are opening a baby's ear-drum. With the least slip inside one will get into the labyrinth, the jugular, or carotid. In very young children that are obstreperous he thinks it is very essential to use an anesthetic. Gas is preferable, but it is expensive. Ethyl chloride is a safe anesthetic for these cases. If cocaine, menthol, and carbolic solution is employed, we are using about 32 per cent carbolic acid. If we leave the solution two minutes we will get very little or no anesthetic effect. That solution put on a cotton probe and pressed against the ear-drum should stay there ten or fifteen minutes, to get the full anesthetic effect. When we take that out we have got a blanching of the ear canal from the carbolic acid, and the wise thing to do is to apply immediately alcohol to neutralize the carbolic solution; and one gets very little trouble from it.

In opening the ear-drum the incision should be made high up and low down. In the upper part of the ear-drum one meets with a flaccid membrane, and there are a lot of ligaments which separate the middle ear from the attic. There may be secretion coming from up in the attic, which is thrown into the aditus and antrum. If we do not take the incision high up, the ligaments will block or interfere with drainage, and we do not drain the most dependent part. We are draining the aditus through the antrum. The incision should be made low down and high up in order to establish good drainage. Perforation in the center of the ear-drum will not do much good.

With reference to the use of oils, Patton wants to emphasize the point that we should hesitate to use oil of any kind in the ear. It is true it does good by its heat, but it soon cakes, and it takes as long a time to remove it as it does to take impacted cerumen or wax out of the ear. Druggists always advise "green oil." He does not know what it is exactly, but it has some opium in it. It does not do any good except by the heat it holds; it cakes up and one has difficulty in removing it. Ten grains of carbolic acid to half an ounce of glycerin, with heat, will relieve the earache. Menthol and carbolic acid both act on the skin. If one rubs it on the hand or anywhere one gets numbness. The same thing happens in the ear. Ten-per-cent carbolic acid in glycerin acts on the ear and relieves pain. The glycerin is hygroscopic; it does not cake, and it is an ideal agent for pain in the ear. If the ear-drum continues to pain, it should be opened. If one cannot get a specialist to assist, and one is not accustomed to using a head mirror in the country, then Patton would advise the physician to spend a week or ten days in one of the ear clinics, where one can be shown how to use the head mirror. Seeing is the main thing in opening the ear-drum.

VITAMINE BALANCING.

The *Boston Medical and Surgical Journal* of June 13, 1918, expresses the belief that much light has been thrown upon the nature of rational dietetics and the prevention of certain specific nutritional diseases by the study of vitamines. Not until recently was it very definitely understood not only that it is necessary to ration from the standpoint of the three food elements—the proteins, the carbohydrates, and the fats—but that there is another element of

the food that must be considered of equal importance. For want of a better, more descriptive name, this vital food element is called "vitamine." It is quite possible to balance the ration and yet have a food that is either intrinsically or through the mode of preparation lacking in vitamines, and which will cause one or other of the specific nutritional diseases, such as beriberi, scorbutus, pellagra, rachitis, or some of the more general evidences of malnutrition. But even the presence of food rich in vitamine is not sufficient to anticipate nutritional disturbances unless the food is so mixed or balanced that there will be present a number or all the necessary vitamines. The body cannot get along with one vitamine any more than with one food element, no matter how much of it there is. While all food contains some vitamine, some foods are very poor in it, and if they form the chief articles of diet it can be seen that nutritional disturbances are bound to follow. Likewise, even though a food has sufficient vitamine, the latter may be destroyed by preparation or otherwise, and the same results follow as if the food were lacking in vitamine. Food vitamines vary in character, so that one vitamine cannot take the place of another, which may be lacking, by increasing the quantity of the first.

Of the non-food substances found to be rich in vitamine, yeast—brewer's yeast—seems to hold first place. In animals experimented upon by feeding them on food lacking in vitamine, and in whom neuritic symptoms were produced, suggestive of beriberi, by feeding them with yeast extract or brewer's waste extract, the condition was either prevented or cured. Brewer's waste freed from the vitamine made a good vitamine-free food with which to experiment. Yeast extracts have been used in a few instances as a therapeutic measure in infants in idiopathic malnutrition with varying success. The question of the adjustment of dosage must first be settled before any extensive work with human beings can be done. But it can be seen that the brewer's product—the beer—would be rich in these vitamines, and in a concentrated form. It is not impossible that hard workers who cannot, perhaps, afford the choice of food containing the vitamines, demand beer because it contains the vitamines in concentrated but cheap form. Since the question of alcohol content in average beer is negligible, it is in all likelihood not wise to withdraw the beer allowance from the laboring element who demand it.

The value of butter-fat in butter, cream, and milk, and the fat of cod-liver oil in the treatment of rachitis, is due to the presence of large quantities of antirachitic vitamines in them. It is for this reason that these forms of fats must be conserved for children when there is a fat shortage. The animal fats, the various margarines, are very low in this form of vitamine, and while they may and ought to be fed to adults, they are distinctly harmful to children.

INDURATIVE OR RHEUMATIC HEADACHE.

PATRICK in the *Journal of the American Medical Association* of July 13, 1918, says that treatment may be divided into the rational and empiric. If, as he believes, the trouble always arises from infection, the rational move is to find the origin and remove it. In the acute cases this alone will suffice. At times the relief is strikingly prompt and complete, being felt within forty-eight hours. In the subacute cases, one generally needs to add rest, heat, and massage. Acetylsalicylic acid and like remedies are not often of much use, though sometimes they seem to afford temporary relief. In the chronic cases one cannot always find a causative focus, or, if it has presumably been found and extirpated, the pain continues.

These are the cases in which repeated and prolonged applications of heat and persistent massage, the latter preferably immediately after application of heat for an hour or more, are indicated. The massage must be rather firm and deep, must be re-

peated about three times a week, and must be persisted in sometimes for many weeks. Good manual massage is infinitely preferable to mechanical vibration. Occasionally he has used the thermocautery with benefit. The point should be white-hot and touched lightly and rapidly over the back of the neck as high up as the hair-line will permit, the points of contact being from about one-eighth to one-fourth inch apart. If properly done, the burns need no dressing and the application can be repeated in from five to ten days. It is well to do a limited area one day and an adjoining one the next.

The prognosis is good—very much better than in chronic arthritis.

THE RELATIVE EFFICIENCY OF THE DIFFERENT MERCURIAL PREPARATIONS IN THE TREATMENT OF CONGENITAL SYPHILIS IN CHILDREN AS DETERMINED BY THE MERCURY ELIMINATED IN THE URINE.

Ramsey contributes an important study on this subject to the *Archives of Pediatrics* for June, 1918.

From his series of experiments he has drawn the following conclusions: In infants and children, mercury when given by the mouth, by inunction, or subcutaneously is excreted at least partly by the urine. In new-born infants and older children, mercurial ointment when placed in contact with the skin, without any friction being used (protected and sealed by wax-paper from being volatilized and inhaled), is taken up by the skin and eliminated in the urine, and continues to be excreted in the urine for some time after all treatment has been discontinued. By inunction (with rubbing) mercury is readily taken up by the skin and eliminated in the urine, and continues to be eliminated for a considerable time. When inunction is given, the maximum daily amount of mercury is usually eliminated during the first twenty-four hours, smaller amounts being eliminated for a variable time after this. Where continuous inunctions are given there is an accumulation in the system and considerable amounts are eliminated at intervals with only traces in between.

It is therefore probable that it is unnecessary to have mercury in contact with the skin, either with or without rubbing, as often or as long as has been generally thought necessary. This, however, must be determined by further clinical investigation. Mercury salicylate, suspended in oil and given subcutaneously, continues to be eliminated in the urine in appreciable amounts for as long as eight days, the daily amounts eliminated varying widely. It is therefore probable that repetition of the treatment, not oftener than at intervals of eight days, would be sufficient. Mercuric chloride by the subcutaneous method, a favorite one in congenital syphilis, continues to be eliminated for eight days. In all cases in which mercuric chloride was used, either by the mouth or by the subcutaneous method, protein was found in the urine. Calomel ¼ grain, every two hours, for four doses, and gray powder ½ grain continued to be eliminated in appreciable amounts, being eliminated during the twenty-four hours following administration. It is therefore probable that the daily use of any of the mercurial salts in amounts usually prescribed is unnecessary and presumably harmful.

INTERPRETATION OF NEGATIVE LABORATORY FINDINGS IN SYPHILIS.

Discussing this subject in the *Journal of the American Medical Association* of July 13, 1918, Dercum said he was very glad to see the emphasis laid on the clinical findings. When the Wassermann reaction was first brought before the profession there was a stampede to the laboratory, but we are now coming back to a deeper consideration of the clinical symptoms. He wants to call attention to a point connected with tension, and that is the great value of spinal drainage. He does not think this point is fully appreciated. It is not sufficient to withdraw five or six cubic centimeters; we

must withdraw sixty or seventy cubic centimeters. In carrying out this procedure he has not had a single mishap, and he has made many spinal drainages. It seems to him the benefit that accrues may be explained as follows: In the first place, in tabes and paresis both the spinal fluid and the cord are under great pressure, and under these circumstances the amount of fluid entering the cord must be diminished. If the pressure is reduced the cord must become hyperemic, and perhaps some of the astounding results we sometimes get in tabes from repeated drainage, every ten days or two weeks, even in the absence of other treatment, is explained by this. Drainage, absolute and complete, is a point of great value.

DICHLORAMINE-T, CHLORCOSANE SOLUTION, IN INFECTION OF THE UPPER AIR-PASSAGES.

In the course of an article on this subject in the *Medical Record* of July 20, 1918, DELAVAN says that to secure the thorough treatment of the tonsil it should first be cleansed with some mild alkaline or salt solution by means of a spray carried into the crypts. Immediately following this, a spray of adrenalin or other similar astringent should be carefully applied for the purpose of contracting the tonsil and thus exposing its recesses. When this has taken effect, the crypts should again be sprayed with the cleansing solution to rid them of all obstructing secretion. Finally the dichloramine-T solution, driven in the form of a spray, must be applied to all crypts and pockets of the tonsil and caused to penetrate to their lowest depths. This is usually not difficult of accomplishment, as the force of the air current from the spray tube causes the crypt entrances to open widely and the crypts themselves to balloon out until they are distended to their capacity, in which position the oil can enter with complete thoroughness. This course of action is absolutely necessary, since attention alone to the surface of a thoroughly infected tonsil cannot succeed.

What is true of the tonsil is even more positively the case with the upper nasal region. The parts lying above the inferior margin of the middle turbinated body are not often freely accessible to any spray. Under the influence of infection they become still less so, by reason of the turgescence and swelling of the soft parts. To be effective, the spray must be driven directly into the affected recesses, for should it impinge upon any projecting angle in its course the current will at once be destroyed and will not enter the parts beyond. In all cases in which disinfection of the upper nasal cavity is required, the following practice is recommended:

First cleanse the mucous surfaces within reach with some simple alkaline spray. Follow this with a spray of adrenalin, the adrenalin spray to be repeated until the upper parts have been successively opened and the whole way to the roof of the nasal cavity is clear. Then, and not until then, and guided by a clear demonstration of the parts by a good light and a nasal speculum, the dichloramine-T spray can be thrown to the remote upper parts which most stand in need of it, and the disinfection of the region made complete. While it may be said that this method, thorough as it is for the nose, does not reach the nasal sinuses, it nevertheless has proved more practically effective than any other method of which we know.

The distinction of the vault of the pharynx may be secured by first applying the adrenalin to the soft palate and the lateral walls of the pharynx, thus facilitating the complete introduction of the spray.

Used in the strength of 2 per cent the solution of the dichloramine-T is seldom irritating. In the case of stronger solutions it may become so, producing a sensation of smarting or burning. This is easily obviated by reducing the percentage of dichloramine-T of the solution to as low as 1 or even ½ per cent. Otherwise than this, the oil is well tolerated and free from any injurious effect. For its application in the form of spray an atomizer must be used

which will throw the spray in all directions. It should be made of some medium which will not be acted upon by the chlorine, and the compressed air should be applied from a good condenser.

Theoretically, the most complete possible exposure of the affected areas should permit the best contact of the disinfectant. Practically, this is found to be true, as proved by the speedy success of the treatment, two or three applications often sufficing to sterilize the parts. Where success is delayed, there will usually be found enlargements of the tonsils or of the adenoids, or marked obstruction of the nose. In such cases, after a reasonable number of local treatments have been given without avail, the removal of the offending lymphoid tissue or suitable attention to the nasal cavity must be considered.

Friedberg in his excellent theses has ably set forth the value of the operative treatment in diphtheria carriers, and concludes with the statement: "When the bacilli persists in spite of any local treatment beyond a period of three to four weeks, the removal of tonsils and adenoids is the most effective treatment and the most uniformly successful that has yet been proposed. The same treatment has been found true in the case of meningococcus carriers."

In cases in which no obstruction exists or in which for any reason the immediate removal of adenoid enlargements is not advisable, the dichloramine-T in chlorcosane solution seems to offer the best hope of a speedy cure. If, as is the fact, complete disinfection can be accomplished in uncomplicated cases with as few as three, two, or even one treatment, the superiority of the method over others is beyond question.

As to the relative merit of the application of the oil solution as compared with the inhalation method, the results seem to show that the former is more prompt in its action and that in uncomplicated cases the number of treatments required is far less. Again, an important advantage is the simplicity of the outfit. An inhalation room could hardly be established at any but a hospital of some importance and at considerable expense, while its apparatus is sufficiently complicated to require expert care. Delavan's desire is to offer a method so simple in itself as to be readily carried out by the average practitioner, with the aid of apparatus inexpensive, durable, and clean, very compact of form and light of weight, and therefore conveniently available for use under all circumstances of medical practice, whether at home, in the hands of the practitioner and the health officer, or in the various branches of hospital and field service of the army and the navy. All that is necessary for this is:

1. The recognition of the principle upon which success absolutely depends, namely, that in order to carry the chlorcosane solution to the chief foci of infection these foci must first be thoroughly exposed, as described above.

2. The application of the dichloramine-T solution by means of a properly constructed spray atomizer, the air current being supplied if possible from an air condenser and not by means of an india-rubber handball.

3. The devotion of time and painstaking care to the effective carrying out of the treatment.

Delavan has personally used this method sufficiently to believe that in it we have a means for overcoming infections of the upper air-passages which is more simple, safe, prompt, and successful than any hitherto known.

PRELIMINARY REPORT ON THE USE OF VEGETABLE MILK.

The *Archives of Pediatrics* for June, 1918, prints a report by CHAPIN on this subject, namely, a preliminary study of a milk prepared from almonds. The composition is as follows: Fat 54.9, protein 21.0, carbohydrate 17.3, ash 2.0, water 4.8. The milk prepared from this nut has a good nutritive value, is pleasant and easy to digest, and seems to us worthy of trial in various nutritional disturbances of early life. Sweet almonds on trituration with

water yield a milk-white emulsion having the appearance and somewhat resembling in taste cow's milk flavored with almonds. The nuts are first finely ground and then covered with water, and allowed to stand in the ice-box over night. The following day they are pressed out, using a potato ricer or fruit press, or they may simply be pressed out by hand through four layers of gauze, which is the method usually employed in the laboratory. One hundred grammes of nuts may be covered with 200 grammes of water, and when this is squeezed out it is diluted up to 300 Cc. of water.

A comparison was made of the chemical analysis of cow's milk and almond milk. There are certain advantages in the use of almond milk that may be considered from both a theoretical and a practical standpoint. As regards the former, (*a*) it ferments much less easily than ordinary cow's milk; (*b*) it has a higher ratio in the form of almond oil which is sufficiently emulsified to render it easily digestible; (*c*) proteins contained in this milk are much less apt to undergo putrefaction than the casein of cow's milk; (*d*) almond milk contains a large amount of phosphorus, and a small quantity of sodium chloride, which would suggest its favorable employment in such conditions as rickets and nephritis. From its low carbohydrate content it would also be indicated in various sugar fermentations. On the practical side, it has been tried on more than 1000 adults by Dr. Kast, and while some dislike it, actual disturbances have never been caused by it. So far no patients have shown an idiosyncrasy to it. Patients kept on almond milk alone maintain their equilibrium of metabolism and usually gain in weight. In the following conditions it was particularly well taken and served a good purpose: nephritis, typhoid fever, intestinal putrefaction, malnutrition, and secondary anemia. This preparation is rich in vitamines. While Chapin does not recommend its permanent use, it is desirable and useful as a temporary substitute.

MALARIA, WITH ESPECIAL REFERENCE TO THE USE OF PROPHYLACTIC QUININE.

TREADGOLD in the *Journal of the Royal Army Medical Corps* for June, 1918, believes that both clinical and theoretical considerations compel us to admit that the general course of the disease may be noticeably affected by the previous taking of quinine, and that the sum of such influences is frequently unfavorable. So far as the Allied armies in Macedonia are concerned, there is every reason to suppose that quinine taken daily over periods of many months has increased the severity and chronicity of the disease in a certain proportion of cases. Taking one thing with another the available evidence indicates that, in Macedonia at any rate, the disadvantages of quinine prophylaxis outweigh the advantages. Treadgold concludes as follows:

1. Small doses of prophylactic quinine, not too long continued, are of proved utility to the natives of malarial countries, both in the absence of antimosquito measures and when such measures are incomplete.

2. Quinine may be given with advantage to immigrants under the following conditions: (*a*) During short journeys when conditions with regard to mosquito prophylaxis are less favorable than usual. (*b*) An occasional dose after an unusually tiring day. (*c*) Nervous people may be advised to take an occasional course as an additional precaution in spite of efficient mosquito prophylaxis.

Speaking generally, it may be stated that quinine prophylaxis is usually a bad investment for immigrants in the absence of protection against mosquito bites; taking one thing with another, the practice would in their case seem to be little more than a pious fraud which has been perpetuated from one generation to the next, simply because public opinion throughout the world has never been sufficiently enlightened to encourage the working out of the problem on scientific lines. A few well-planned experiments, carefully and simultaneously conducted in several countries, and these

conclusions might have been reached many years ago. We know the experimental method to be at the bottom of all scientific and industrial progress, yet we refuse to admit its very obvious utility in preventive medicine.

THE SCABIES PROBLEM ON ACTIVE SERVICE.

MacCormac and Small in the *Journal of the Royal Army Medical Corps* for June, 1918, reach these conclusions:

1. Scabies in soldiers differs in type from the ordinary form of civil practice, particularly in the frequent absence of burrows or other lesions upon the hands, and in the great liability to pyodermic complications.

2. The primary disease is often masked by complications. In every case of impetigo, boils, dermatitis, or inguinal adenitis, scabies must be carefully excluded before the diagnosis is considered complete.

3. Cases of scabies complicated by any of the above necessitate about ten times as long a period in the hospital as do simple cases. Therefore early diagnosis and treatment, before secondary diseases have become established, are of the greatest importance.

4. Regular medical inspection is essential for the detection of "carriers." Infected men should be segregated and treated at the earliest opportunity. Horses may also require inspection. Blankets, being the chief source of spread, should be sterilized as often as possible.

5. Treatment by means of sulphur vapor is a method harmful often to the patient, and at all times dangerous to the community in that it manufactures a class of scabies "carrier." In the interests of the army it should be discontinued.

6. The method of treatment most suitable to service conditions on account of efficiency, simplicity, and cheapness, is inunction with sulphur ointment, but this must be carried out in a methodical and thorough manner, and with careful attention to the necessary details.

THE STERILIZATION OF LOCAL ANESTHETICS.

Macnaughton-Jones in the *Lancet* of June 29, 1918, writes to suggest a simple but effective method of preparing a sterile solution of cocaine or other local anesthetic which may also contain adrenalin chloride. It consists in preparing a solution of sodium chloride together with the anesthetic or anesthetics and adrenalin chloride, each constituent being present in such quantity that a dilution with many (*e.g.*, 40) times the volume of water will give a solution containing the requisite percentage of each. The preparation is placed in a sealed vial or ampoule and kept until required. Sterile water is added immediately before injection. Experiments by Matthews demonstrate that even if the preparation be inoculated with the ordinary forms of bacterial contamination the presence of concentrated salt renders it sterile in a few days.

The percentage of salt and anesthetic are quite arbitrary, but it may not be out of place to review a few facts about osmotic pressure and deductions from them which are generally accepted. It will enable any one desiring to adopt the method to have a solution prepared readily of any anesthetic of any required strength and having a given osmotic pressure.

A 0.95-per-cent solution of sodium chloride is isotonic with mammalian serum, and such a solution produces minimum injury to tissues, if these are immersed in it or permeated by it for a prolonged period. Any increase or decrease in the strength of the solution causes an osmotic flow out of or into the tissues.

The sodium chloride in an injection may be increased to 2.5 per cent or reduced to 0.55 per cent without producing material damage or irritation. It can be further increased to 5 per cent with very little ill effect, but a reduction from 0.55 per cent to zero is attended by injury to the tissues rapidly increasing in degree as the strength is reduced. As reduction takes place a point is reached at which simple saline solution produces anesthesia, but if reduced to such a point that it will even diminish

sensibility the injection becomes both painful and injurious.

Infiltration of the tissues with pure cold distilled water is an effective method of producing local anesthesia, but the injury to the tissue is such that necrosis may result. The lower the osmotic pressure, however, the more rapid and complete the effect of any given solution of an anesthetic.

It is therefore desirable that the osmotic pressure should be reduced as far as possible without risk of producing irritation or such injury to the tissues that healing would be affected. In the examples which follow an osmotic pressure equal to that of a 0.4-per-cent (4-per-1000) solution of NaCl is adopted.

It is easier to prepare a dilution having an osmotic pressure comparable to a given solution of salt than one expressed in terms of atmospheric pressure of a column of mercury. It is only necessary to calculate the comparative pressure produced by the anesthetic, and if this be 1/3, 1/4, or 1/5 that of sodium chloride, regard the solution as having 1/3, 1/4, or 1/5 the quantity of that salt present, and then add sufficient to make the equivalent of a 0.4-per-cent solution.

The osmotic pressure respectively produced by any two salts in solution is inversely proportionate to their molecular weights, which can be found in many books such as Martindale's. Thus the molecular weight of cocaine is 5.75 times and that of novocaine 4.63 times as much as that of NaCl. Therefore, disregarding error due to ionization, the osmotic pressure exerted by a given quantity of sodium chloride in solution is equivalent to 5.75 times the quantity of cocaine hydrochloride, or 4.63 that of novocaine.

Let it be assumed that a solution is required containing 4.6 parts per 1000 of kerocaine (novocaine or procaine), and having an osmotic pressure equal to that of a 4-per-1000 solution of NaCl. A solution containing 4.6 parts per 1000 of procaine has an osmotic pressure equal to one containing 1 per 1000 of salt. It will therefore be necessary to add 3 parts per 1000 of the latter. Adrenalin chloride is added in such infinitesimal quantity that its osmotic influence may be disregarded.

A simple method of preparing the concentrated solution is to take the quantities of anesthetic, salt, etc., required per 1000 and dissolve in water, but make up to 25 instead of to 1000.

The concentrated solution he has prepared contains:

Procaine	3.25 (13 per cent)
NaCl	3.25 (13 per cent)
Adrenalin chloride solution (1 to 1000)	8.00 (32 per cent)
Water by weight (or metric)	ad 25.00 (100)

This solution, prepared without antiseptic precautions and after contamination with Bacillus coli and other organisms, was sterile a week after preparation. When diluted with 40 times its bulk of water it contains 3.25 parts per 1000 of both procaine and sodium chloride, gives perfect anesthesia, and has an osmotic pressure approximately equal to that of a 4-per-1000 (0.4-per-cent) solution of the latter salt. The adrenalin is not in sufficient strength to arrest hemorrhage, but secures prolonged anesthesia. A certain amount of hemorrhage during the majority of operations is easily controlled and, in his opinion, is preferable to the risk of a subsequent hematoma, which he has seen develop on more than one occasion.

If a 2-in-1000 (0.2-per-cent) solution of cocaine be desired the formula would be modified as follows:

The osmotic pressure of such a solution is only equal to that of a 0.35:1000 NaCl, and consequently about 3.65:1000 of this salt is added; but, inasmuch as cocaine produces anemia, the adrenalin may be reduced if desired.

The concentrated solution would be:

Cocaine hyd.	2.00 (8 per cent)
Sodium chloride (approx.)	3.75 (15 per cent)
Adrenalin chloride (1 to 1000)	6.00 (24 per cent)
Water by weight to	25.00 (100)

It is suggested that a solution be prepared 40 times the strength of that required for

injection, because increments in the dilute solution of 1/4, 1/2, 3/4, or 1 per 1000 correspond to an increase of 1, 2, 3, or 4 per cent in the concentrated solution, and these are the increments usually desired.

Three solutions were submitted to Dr. Matthews for an opinion as to their sterility. It is possible to adopt this method of sterilization with confidence. His report follows:

Experiments to show the sterility of and the bactericidal properties of: (1) Cocaine hydrochloride, 7½ per cent in 15-per-cent NaCl solution; (2) Procaine, 7½-per-cent solution; (3) NaCl, 15-per-cent solution.

	July 14, 1917.				July 16.		July 20.
	Cholera.	Pyocy.	Strep.	Staph.	Pyo.	Staph.	Staph.
7½ per cent cocaine and salt 15 per cent	Nil.	Nil.	Nil.	Sparse growth.	.....	Nil.	.....
Procaine 7½ per cent	Nil.	Slight growth.	Nil.	Copious growth.	Nil.	Fair growth.	Fair growth.
Salt 15 per cent	Nil.	Nil.	Nil.	Six cols.	.....	Nil.	.....

The three solutions as supplied were sterile. Each solution was tubed off into four sterile, plugged test-tubes, and the 12 tubes were divided into four groups, A, B, C, and D, each group containing a tube of solutions (1), (2), and (3) respectively.

On July 12, 1917, the tubes of group A were inoculated with a loopful of young cholera vibrios, those of B with B. pyocyaneus, of C with streptococci, and of D with staphylococci.

On July 14 subcultures on agar were made from these tubes, and on July 16, in those instances where growth had occurred, further subcultures from the original tubes were made, and similarly again on July 20. The results are set out in the appended table.

The conclusions would seem to be: (1) That 15-per-cent NaCl solution has enough bactericidal properties to kill the cultures experimented with in forty-eight hours; (2) that 15-per-cent NaCl solution containing 7½ per cent cocaine had slightly less bactericidal properties; (3) that a 7½-per-cent procaine solution is considerably more deficient in bactericidal properties, and cannot be expected to kill staphylococci when introduced in large quantities in a period of eight days.

UNSUSPECTED SYPHILIS: A STATISTICAL STUDY.

McLESTER (*American Journal of the Medical Sciences*, 1918, vol. clv, p. 320) states that the object of this paper is to present certain statistical data drawn from the Wassermann reaction as applied to 567 consecutive private patients. Most of these patients were of the well-to-do classes, and all of them were seen in consultation, which fact warrants the assumption that they exhibited, as a whole, the more serious or puzzling diseases of inner medicine. None were supposed to suffer with venereal disease. Of these 567 consecutive patients, 94, or 16.5 per cent, gave a positive Wassermann reaction; 7, with a negative Wassermann reaction, showed unmistakably clinical evidence of syphillis, thus bringing the known percentage of this disease to 17.8. These figures, then, represent a legitimate estimate of the frequency of syphilis in the better class of patients who suffer with the more obscure or serious medical syndrome.

Among the 94 individuals whose Wassermann reactions were positive, only 27, or 29 per cent, admitted a venereal ulcer or other evidence of syphilis. It is startling to note that of this number 21 believed themselves cured, most of them basing their belief upon a physician's advice. Another group of 9, while categorically denying syphilis, gave histories which to the initiated pointed unmistakably to such an infection. Adding these 9 to those who admitted an infection, we have 36 patients, or 38 per cent, whose histories pointed with reasonable certainty to syphilis. The remaining 58 (62 per cent

of the entire Wassermann-positive group) gave no such history, direct or suggestive. It is interesting to inquire further into these 58 "Wassermann-positive, history-negative" cases. Six on being confronted with a positive Wassermann reaction then recalled a long-forgotten venereal ulcer. The knowledge gained from a positive Wassermann reaction led always to renewed delving into family and past histories, and in eight instances syphilis was thus found in husband, wife, or parent. Without the stimulating guidance of a known positive Wassermann reaction this information would have been lost. There were ten others of this group who presented clinical evidence which, apart from the serum reaction, would alone point to syphilis. This included four instances of aortic aneurism, one of aortitis, five of characteristic skin or throat lesions, one of a paroxysmal hemoglobinuria, one of characteristic neuroretinitis, and one of typical cerebrospinal fluid changes.

Turning now to a consideration of the influence of syphilis upon the several internal organs, the heart and the aorta here, as always, are entitled to first place. It is difficult to differentiate invariably between essential myocardial disease, cardiorenal disease, and simple hypertension. In this series were 30 patients with essential myocardial disease, of whom 14, or 45 per cent, gave a positive Wassermann reaction. Four of the five patients with aortic aneurism gave a positive Wassermann reaction. The arterial hypertension group presents a rather heterogeneous lot, for those are included who were with and without demonstrable arteriosclerosis, as well as those with and without kidney disease. There were 65 such patients, and 15, or 23 per cent, gave a positive Wassermann reaction. There were 26 patients who gave roentgenologic and other evidence of ulcer of the stomach or duodenum; eight gave a positive Wassermann reaction, and five of these, under the influence of salvarsan as well as dietetic and other measures, have apparently recovered. Of 28 patients with pulmonary disease, apparently tubercular, six gave a positive Wassermann reaction, and of these six only two showed tubercle bacilli in their sputum; five were given antiluetic treatment, all of whom have experienced satisfactory improvement or cure, but since all had the benefit of the usual hygienic measures, conclusions are difficult. Observation of the roentgenologic signs and the clinical course in one of the patients at least tempts the author to state unreservedly that he was dealing with syphilis alone.—*American Journal of Syphilis,* April, 1918.

AN ANALYSIS OF THE WEAK FOOT WITH REFERENCE TO PRECISION IN THE USE OF DESCRIPTIVE TERMS IN TEACHING.

WHITMAN (*Medical Record,* July 13, 1918) reports that, in 1917, 2736 new patients applied for the treatment of weak feet at the Hospital for Ruptured and Crippled, and it has been estimated that from 30 to 40 per cent of those examined by the exemption boards during that year presented either potential or actual disability of this character. Numerically, therefore, and particularly from the military standpoint, the weak foot is the most important of the orthopedic affections.

The most direct of the predisposing causes of the so-called flat foot is a posture that simulates the deformity, which may be defined as a persistent attitude of abduction. In this attitude, the mechanism is functionally out of gear and is subjected to abnormal strain when in active use. Treatment, therefore, whether preventive, curative, or palliative, depends for its effectiveness on the restoration as far as may be of the normal mechanical relations.

The first essential of effective demonstration is precision in the use of descriptive terms, and since there is an evident confusion on this point as it relates to the weak foot, one may with advantage analyze the attitude, that when persistent becomes deformity, before deciding on the term that best describes it.

When normal feet are placed side by side with the heels and toes apposed, an interval persists between them, caused by the slight outward curve of their inner borders. In

this position the line of strain transmitted from the muscles of the calf passes through the center of the leg to the neighborhood of the second and third toes, and the weight is properly balanced on the foot.

The most important indication of the potential or actual weak foot is a bulging inward, so that the two feet when placed side by side are in contact throughout their entire extent, or, if the bulging is more pronounced, it is impossible to appose the heels and toes simultaneously. If the heels are in contact, the toes diverge, or *vice versa.*

The bulging is caused by the inward and downward rotation of the astragalus upon the os calcis, rolling the foot over toward the inner side, depressing relatively the arch, and since the leg, resting on the astragalus, must rotate inward with it, the line of strain is deflected from the center of the fore foot and falls over its inner border. Thus the most noticeable of the physical signs of the weak foot on inspection is the inward bulging; the most significant is the change in the relation of the power to the fulcrum; the least important, the incidental depression of the arch.

This attitude, characteristic of the weak foot, may be described by any one of three synonymous terms: Eversion; abduction; pronation.

Eversion, to turn over, refers primarily to the relation of the sole to the base, in which its inner border is depressed and the outer elevated.

Abduction refers primarily to the divergence outward of the foot in its relation to the leg.

Pronation, analogous to the movement of the forearm that turns the hand over, refers primarily to the inward rotation of the leg and the effect upon the foot.

The consideration of the weak foot from the standpoint of functional mechanics clears away much of the obscurity about what is in reality a simple subject. For example, a foot habitually used at a mechanical disadvantage is predisposed to injury, and since the primary symptoms of all weak feet are those of strain, the immediate disability has no proportionate relation to the degree of deformity. In fact, the well-formed foot subjected to persistent strain provides the most favorable opportunity for progressive and irremediable disability, since stability (flatness) cannot be acquired without great lateral distortion and consequent disorganization of its structure; whereas the actual flatfoot, an individual or racial peculiarity, or one that is acquired in early life, may be perfectly competent because stability does not require excessive lateral distortion of its component joints.

From this standpoint one may estimate fairly the prospective ability of the weak-footed recruit.

The most favorable type is the well-formed foot in which the normal relations can be voluntarily restored.

The next is the actual flat foot with but little lateral distortion.

The last is that in which the changes of structure in accommodation to habitual deformity have advanced so far that the normal relations cannot be restored either voluntarily or by manipulation.

The treatment of the weak foot follows the same principle. The first indication is to relieve the symptoms of strain and injury, but the final purpose is to assure the normal relation between the power and the fulcrum, as the essential preliminary for the restoration of muscular power and balance upon which permanent cure depends. It is this purpose and the means employed to accomplish it that distinguish reconstructive treatment from the common routine, which is practically limited to the relief of the immediate symptoms.

WEAK FEET IN CHILDREN.

GROSSMAN (*Medical Record,* June 8, 1918) states that in infancy and early childhood the feet appear to be flat; this flatness is not permanent, but is the result of the osseous structures of the arch being surrounded by pads of fat. This has been proven by examination of frozen sections of specimens. As the child grows and becomes thinner the fat gradually disappears and the arch becomes more conspicuous.

This change usually begins after the second year of life and is completed after the third year. Footprints of infants up to three years of age give a flat impression; these flat impressions are normal for that period. After the third year the impression is the same as that found in the normal adult foot.

Weak feat occur more frequently in females than in males. It is quite a common condition before the thirteenth year of age is reached.

Poorly fitting shoes in children can in the majority of cases be eliminated as a causative factor in the production of weak feet. The shoes made for children are very good ones; they have broad toes and are roomy enough to allow for free action of the small muscles.

In the average case the foot appears to be turned outward below the ankle, and the axis of the lower leg presents an outward deviation in the plane of the ankle. The internal ankle may project from a slight to a considerable degree. The arch of the foot is not only lowered, but in severe cases appears to be convex, the bulging resulting from constant lowering and outward turning of the head of the astragalus and scaphoid. The inner border of the foot appears to be much longer than the outer.

The children are brought to the clinic because they always wear their shoes out on the inner borders of the soles and heels. In these cases the shoes are not only worn out on the inner borders of the soles and heels, but the inner surface of the last of the shoe is distinctly prominent and bulging, the result of the constant pressure of the displaced astragalus. Occasionally the children will complain of pain in one or both legs, the location of which is variable. At times it may be referred to the inner border of the foot, but more often to the calves of the legs. Other children easily tire and want to be carried continually. In a number of cases the children are brought to the clinic to be treated for a sprain or fracture of the ankle and the presence of weak feet is discovered for the first time. In these cases history of any of the aforementioned subjective symptoms cannot be obtained. The mothers are unaware of the fact that their children have weak feet.

The most important objective symptom is the eversion of the heels and heel cords. In the normal foot the heels and heel cords are either parallel to or converge slightly toward a line drawn perpendicularly through the center of the trunk and continued downward to the ground. In weak feet there is a tendency for the heels and heel cords to be everted, to roll away from this midline. This eversion varies with each case. In mild cases it may be very slight, while in the more severe types it is very marked. With this eversion there is a lowering of the arch as a whole. In the early cases disturbance in the osseous structure of the arch is not discernible; nevertheless there may be a slight stretching of the ligamentous and muscular structures. As the condition progresses the ligaments and muscles become more and more stretched until finally there is complete collapse of the keystone of the arch and the sole of the foot is applied flat to the ground, resulting in a pes planus. With these changes the eversion of the heels and heel cords keeps pace, so that marked eversion is always present in these advanced cases.

The displacement of the anterior tibial line is another valuable aid in diagnosing weak feet. Normally the anterior tibial line falls over the first or second toes; in weak feet it usually falls toward the inner side of the big toe or over the center of the inner border of the foot. The anterior tibial line is found by following a line passing along the crest of the tibia and continuing it along the dorsum of the foot.

Regardless of the presence or absence of weak feet, broad-soled sandals for the younger children and shoes for the older ones should always be recommended. These allow of free and unrestricted action of the toes and small muscles of the fore part of the feet.

In very young children proper sandals or shoes alone will usually overcome weak feet. The sandals or shoes should be broad-soled, they should have a lift of an eighth to a

quarter of an inch on the inner border of the soles and heels. The thickness of the lift depends upon the amount of valgus present. The mild cases should have a lift of an eighth of an inch and the severer ones a quarter of an inch. Lace shoes are preferred to those that are buttoned.

If after a reasonable length of time the shoes fail to relieve the condition a brace must be added to the treatment. The brace which has been found to be very efficient is the Whitman. The brace is modeled upon a plaster cast of the foot taken while the foot is held in the fully corrected position. It fits the arch of the foot accurately, extending forward to the ball of the big toe, outward round the outer border of the foot, and backward to just in front of the tuberosity of the os calcis. On the inner side it is enlarged upward and extends to a point one-half inch below the internal malleolus. With a properly made brace the foot should rest upon its normal bases of support—*i.e.*, the under surfaces of the heads of the first, fourth, and fifth metatarsal bones and the tuberosity of the os calcis. These braces should be accurately fitted and each should be made for the individual who has to wear them.

The method of taking the cast of the foot which the writer has found efficient is a very simple one. The patient sits upon a chair with his foot upon a second chair of the same height. On this chair is placed a small cushion covered with a towel on which talcum powder has been sprinkled. Plaster-of-Paris is then mixed with water to form a thick cream; a piece of gauze is then steeped in the plaster-of-Paris cream and laid upon the towel, underneath the foot, so that the outer border of the sole rests upon it along a line about an inch from the edge. The foot rests upon its outer border and is held at a right angle to the leg. The gauze is then wrapped around the foot, covering in the heel behind and extending as far forward as the cleft between the toes; it should reach up above the internal malleolus, but should not overlap the dorsal surface to any extent. This covering is allowed to set, and when the plaster is hard there is no difficulty in removing the foot from it. A fresh plaster cream is now made. The mold is well powdered and the plaster cream is poured into it and arranged so that it fills the mold, but does not project beyond it in any direction. When the plaster has set the sides of the mold are forced aside, the cast is removed and properly carved and marked for the instrument-maker.

The brace is made of thin steel or aluminum alloy and should extend forward to the line of the metatarsophalangeal joint of the great toe and backward to the center of the heel; on the outer side it grasps the foot just behind the prominence formed by the fifth metatarsal bone, and on the inner side of the foot it extends upward to one-half an inch below the internal malleolus. It should fit the cast accurately, except over the heel, where it should be slightly flattened so as to make it steadier. It should be worn for short periods at first, the length of time being gradually increased as tolerance is established.

In older children we have slightly different conditions with which to contend. Pain, rarely present in the younger children, is one of the common complaints of older ones. For the acute pain strapping offers the quickest relief. One end of a strip of adhesive plaster about eight inches long and one inch wide is applied to the outer side of the ankle just below the external malleolus; the foot is then adducted as far as possible and the plaster drawn tightly beneath the sole up the inner side of the arch and the leg, being kept in this position by one or two strips about the calf. Strips about three-quarters of an inch wide are then applied in a figure-of-eight manner about the arch and ankle, beginning at the back of the heel and extending as far forward as the base of the first metatarsal bone. Strapping should be done twice a week and continued until the pain has subsided. Where necessary, shoes and braces should be recommended.

When children are old enough exercises have proven valuable adjuncts in obtaining a successful issue. The following exercises have been found to be very efficient:

Tip-toe exercises: The patient places the limbs in the attitude of moderate inward rotation, raises the body on the toes to the extreme limit, the limbs being fully extended at the knees, then sinking slowly, resting the weight on the outer borders of the feet in marked varus, repeating about twenty to thirty times.

Walking in bare feet.

Walking on the fore part of the foot.

Grasping motions with the toes, exercises with foot weights.

Bicycling has also proved of value and should be highly recommended.

These exercises should be practiced twice daily and should not be carried to the extent of tiring the patient.

TREATMENT OF CHANCROIDS AND THEIR BUBOES.

POIRSON (*Medical Record*, June 29, 1918), in charge of a venereal service in the French army, has published a Paris graduation thesis on this subject, an abstract of which appears in the *Journal de médecine et de chirurgie pratiques* of April 10. This treatment is extremely simple, recalling the old management of these lesions with ethereal solution of iodoform, but apparently more efficacious, and free from the tell-tale odor. A solution of sodium arsenate in alcohol, one part to fifty, is said to be so efficient that a single application may suffice. There is no preliminary cauterization.

The first step in the management consists in cleansing the sores with tampons soaked in ether. The process is continued until not a trace of pus remains in evidence. The arsenate solution—or rather suspension, because the salt is poorly soluble in 95-percent alcohol—is shaken and applied with a camel's-hair brush thoroughly to the sore or sores. In order to hasten the evaporation of the alcohol a jet of air may be blown upon the lesions. The arsenic is thus left upon the latter as a fine coating. Soon afterward a second application is made and a piece of sterile gauze is placed over it. In certain locations this dressing will have to be removed often because it is worn away by secretions, etc. Even under unfavorable circumstances, from three to five dressings will turn the ulcers into simple raw surfaces, which heal rapidly of themselves. The author advises, however, the use of alterative applications until healing is complete, iodoform being a good dusting powder.

Much of the efficacy of the treatment is thought to be due to the preliminary treatment with ether. If a bubo has formed, but without the immediate menace of suppuration, the author injects a solution of arsenic directly into the mass, the strength being one-half of the preceding. If pus has already formed, it is evacuated by puncture with a small trocar, which is also used to break down any septa in the pus cavity. The solution is then injected as before. In ulcerated chancroidal bubo the treatment does not depart from that of the chancroid. The author has treated 250 patients with his method, the average duration of treatment being 18 days for simple chancroid and bubo up to 29 days for complications.

PSYCHIC EFFECTS IN SURGERY.

Much has been heard about needless surgery; and when a body of eminent surgeons deem it necessary for the protection of the reputation of their own branch of practice to sign an agreement not to perform unnecessary operations, the accusation from without would seem to receive full confirmation.

But there is little doubt that, as in the giving of drugs, the use of the knife often produces good effects from a purely psychic influence. The effect of an operation, especially of the preparations for an operation, upon the patient is profound, and were there not hope and expectation of improvement back of it all, the bodily results of mental states would often prove disastrous. Improvement is expected, and improvement usually takes place, therefore, no matter what emotional disturbance is undergone.

Operations are of such common occurrence and so much discussed that by a cer-

tain class of persons, women especially, they come to be desired as a curative means, and even when not needed for mechanical abnormalities or for the removal of foci of disease, their performance produces good results. The patient, with a few exceptions, is satisfied with the experience, and above all feels (even if the symptoms are not removed) that everything possible has been done. It must be a hard-hearted surgeon who would refuse to operate in such a case, especially if the fee were at all adequate; and since the risk is slight, he is certainly not more culpable than the physician who doses his patient, to the injury of the digestive apparatus, with drugs whose effects are likewise psychic. How to twist the mentality into healthy channels without the use of either the drug or the knife, especially if a friend of the victim has recovered through such treatment, is not an easy proposition—certainly far less simple than the use of material means as an aid to the cure.

The experiment of giving bread pills to patients in one medical ward of a hospital, and regulation drugs to those in another, has been tried, and the results are familiar to the reader. A comparison of the effects of a scratch through the skin and a few superficial stitches and some more complicated procedures in selected cases (for which experiment there would be many cases to select from) might prove equally instructive.—*New York Medical Journal*, Aug. 31, 1918.

TRIGEMINAL NEURALGIA.

Frazier (*Journal of the American Medical Association*, May 11, 1918) says that there is nothing obscure about trigeminal neuralgia save its origin. The patient has made the diagnosis before the surgeon is consulted, and treatment, to be effective, must include either alcoholic injections or the radical operation. In these few words have been summed up the essential features of this unique lesion of the sensory system.

True trigeminal neuralgia must not be confused with a peripheral neuritis initiated by some infective focus in tooth or sinus, or with the neuritis of toxic or obscure origin. One occasionally hears or reads of the cure of trigeminal neuralgia by the drainage of a sinus, by an intranasal operation, or by the removal of an infected tooth. The writer has never seen or operated on a patient in a case of the major type of trigeminal neuralgia in which there was any reason to suspect any one of these lesions as the exciting cause.

Were the author to write on the pathogenesis of the disease, he should describe it as a disease of central, that is, of ganglionic, origin, and should hypothecate a lesion in the nature of sclerosis. This is a matter, however, of a speculative nature. If this view were accepted, it would serve this one useful purpose: Vain attempts to find peripheral lesions as a cause would be abandoned, and patients would be spared many sinus operations and the extraction of a majority of sound teeth in the upper and lower jaws. Most of the author's patients have been victims of these vicious practices before they came to him for treatment.

The facts presented in this article are the outcome of the author's experience with 302 cases of neuralgia of the trigeminal nerve. This includes thirty-nine peripheral operations, ninety-nine alcoholic injections, 130 intracranial operations, and thirty-four cases that were not treated.

It is the treatment of trigeminal neuralgia with which this paper is chiefly concerned. There are no grounds for discussing any method of treatment other than alcoholic injection or the avulsion of the sensory root. The surgeon is spared the necessity of discussing other methods of treatment, since by the time the patient consults him all the useless remedies—and they are innumerable—have been tried and have failed, and what reserve of morale or funds the patient may have stored up has, in many instances, been exhausted.

Under what circumstances should the alcoholic injection be recommended, and under what circumstances the operation?

The answer to this question must be qualified by the circumstances themselves. We might divide the patients into two groups: in the first those who have long been sufferers, and in the second those in an earlier stage of the disease. The alcoholic injection is of only transitory effect. Properly given, it will arrest the pain immediately and absolutely, and for an average period of nine months. It is in no sense of the word a permanent cure.

The radical operation assures absolute and permanent relief. When the writer lets the patient choose, after presenting the facts to him, he usually chooses the injection. The injection given, he leaves, pitifully grateful, and encourages himself to believe that this is the end of his suffering. But before the year ends the pain returns. He fights it out for a while and then returns submissively for another injection. Three or four years pass, with as many injections, and either because the injections are becoming less effective, or—and this is the more potent influence—because his courage is failing, the patient, despairing of permanent relief, will have no more injections and wants the operation. This is a very fair analysis of the psychology of the subject of this disease.

Turning now to the second group of patients in whom the disease is of long standing—that is, from five to ten years—we find the situation very different. For this type of patient there is only one acceptable treatment, namely, radical operation. The patient should be in the hospital four or five days before the operation, both for observation and examination. Sometimes mistakes may be made in diagnosis. If the patient is suffering from a neurosis, the surgeon will regret having undertaken to relieve a pure neurosis by any surgical procedure. Since 1901, in almost all his cases he has practiced avulsion of the sensory root, the operation proposed by Spiller as a substitute for gangliectomy, and described by the neurologist von Gehuchten as the physiologic extirpation of the ganglion. Physiologically sound and technically practical, the avulsion or even the division of the sensory root is in every sense a radical cure. In considering the results, Frazier refers only to the major operation. His first operation was performed in 1901, and when last heard of, fifteen years after the operation, the patient was free from pain. In all his 121 intracranial operations he has been called on only once to operate a second time. In this case he found that the inner portion of the root had escaped him.

The sensory and motor sequelæ are of no very great moment, at least when compared with the intense suffering for the relief of which the operation is performed. The only sequel that might be said to be of serious moment is keratitis. This lesion of trophic origin will occur once in a while. If promptly recognized and properly treated, the corneal ulcer will heal.

In regard to the risks of the major operation, there is naturally a good deal of apprehension on the part of the patient, but usually much more on the part of the family physician. The operation, of course, has its attendant risks, which we might suppose to be proportionately greater than in other major operations on patients past middle life. The supposition, however, has no foundation in fact. There seems to be an extraordinary misconception on the part of the profession as to the present status of the operation on the ganglion or root. It is usually represented as a court of last resort, a sort of kill-or-cure method, as a result of which the patient, if he survives, will be paralyzed on one side of the face and will lose his eyesight. Because of the frame of mind in which the patient consults the surgeon, the former needs some reassuring. In stating the risks of the operation, Frazier refers only to his own clinic. Since 1901 there have been, all told, four deaths in 160 operations. Two of these were due to apoplexy, and all of them were among subjects of the 121 intracranial operations. There was one death in 1904, one in 1910, and two in 1912. In a series of eighty-seven consecutive operations there have been no deaths since 1912.

Over the radical operations, such as the removal of the ganglion, the Abbe operation or the Hutchinson operation, avulsion of the sensory root has so many advantages that it should be and is recognized as the operation of choice. It is easier of execution than any other, it subjects adjacent structures to no risk, and it is attended with a smaller percentage of corneal complications and with a lower mortality. On the whole, it is the most satisfactory surgical procedure with which the writer has to deal.

THE STERILIZATION OF WOUNDS BY PHYSIOLOGICAL AGENCY.

WRIGHT, FLEMING and COLEBROOK (*Lancet,* June 15, 1918) in an admirable laboratory study of this subject conclude as follows:

It has been erroneously inculcated that every wound should be sterilized before closure; and that, therefore, primary suture should be avoided and secondary suture undertaken only after a course of antiseptics. There is now no question, with respect to primary suture, that the wound taken after early surgical cleansing and resection is as good as sterile; and, with regard to secondary suture, undertaken with a wound in good condition and a purely serophytic infection, that such operative procedure, provided it leaves behind no infected dead spaces, directly contributes to sterilization.

It has been taught that we should judge of the fitness of the wound for closure by necropyocultures and direct microscopic examination of the pus. We have learned that it would be infinitely more reasonable to base our judgments upon the results of viopyoculture.

It has been taught that suture cannot be successful in a wound containing a hemolytic streptococcus pyogenes. We have seen that leucocytes can, given proper conditions, successfully combat this, and of course all other streptococci; and that these conditions can be realized in connection with the suture of wounds.

It has been taught that for the removal of sloughs from foul wounds chemical solvents are required. We have learned that sloughs can be removed by tryptic ferment set free from disintegrated leucocytes, and that the liberation of this ferment can be greatly accelerated by breaking down the leucocytes in the discharges with hypertonic saline solution.

Lastly, it has been taught in connection with antiseptics that sterilization is obtainable only by continuous or very frequently repeated application. We have learned that there is nothing to prevent any part of a wound surface which has been washed quite clear of albuminous matter being sterilized by a single application of antiseptics.

VENEREAL CONTROL IN THE ARMY.

SNOW and SAWYER (*Journal of the American Medical Association,* Aug. 10, 1918) contribute an article on this subject in which they reach the following conclusions:

Venereal diseases are the greatest single cause of disability in the army.

Most of the cases of venereal diseases among the United States soldiers, over five-sixths of the total in units from which the figures have been obtained, were contracted by the men before enlistment.

Exposure of the soldier to venereal diseases is being successfully reduced by education, wholesome recreation, the enforcement of laws against prostitution and alcohol, and the discovery and control of venereal disease carriers.

These measures are applicable to civilian communities outside the extra-cantonment areas, and should be generally applied for the protection of the health of the future soldier and of the general public.

Venereal disease control should be under the general direction of the public health authorities, but they should receive the cooperation of educational and law enforcement agencies, and should not hesitate to employ lawyers and other men and women trained in non-medical lines, just as en-

gineers are called on to remove the causes underlying water-borne typhoid.

In the army, venereal disease is still further reduced by compulsory early, or prophylactic, treatment of men exposed in spite of the measures aimed at preventing such exposure.

The reduction of venereal diseases, as a group, forms the greatest public health problem of to-day and the one which gives the most promise of solution in the immediate future. Efficient measures of prevention are known and are being demonstrated, and need only to be more widely applied.

A STUDY OF A SERIES OF CASES OF INJURY TO THE CHEST, SEEN AT THE BASE.

DEAN (*Quarterly Journal of Medicine*, January, 1918) reports on his experience with 129 chest wounds admitted to a base hospital usually within a week of the time of being wounded. The following were some of the points brought out by this experience:

If a hemothorax has been produced by a bullet wound it is very improbable that sepsis will occur. Of those produced by shell wounds about half are infected.

Many patients with penetrating wounds, both bullet and shell, when seen at the end of a week, show no signs of lung injury.

Pain and, more important, tenderness and hyperesthesia of the skin in a case of hemothorax should make one strongly suspect that there is infection.

Cyanosis and dyspnea generally mean that there is infection of a hemothorax unless the latter is a very large one, but of all the early symptoms of infection, sleeplessness is perhaps the most valuable.

The loss of weight occasioned by a septic hemothorax is a striking feature and in excess of and more rapid than that produced by sepsis in other situations.

Lobar pneumonia complicating a hemothorax is not as serious as might have been expected.

Contrary to expectation, abscess of the lung is a rarity.

Bronchial breathing is often heard over a hemothorax. The most valuable signs for the differential diagnosis between a hemothorax and pneumonia are the degrees of impairment of the percussion note and the presence or absence of râles.

The *x*-rays are essential for the diagnosis and treatment of hemothorax.

After shock has subsided pallor is not seen in patients suffering from even a large hemothorax if it is sterile.

A hemothorax, if of moderate size, should be aspirated after six or seven days, and no harm will result if this is done as a routine for every hemothorax.

Clotting to a degree sufficient to prevent efficient aspiration of a hemothorax is rare.

Secondary hemorrhages after the first few days do not occur in sterile cases.

The position of the diaphragm is often abnormally high in cases of hemothorax, and this fact is to be remembered when aspiration or resection is performed.

It is rare for organisms to be found by culture in a hemothorax fluid if they cannot be seen in a stained film prepared from the fluid.

Resection is not indicated for every case of infected hemothorax. The bacteriology, general condition of the patient, and the size of the hemothorax must all be taken into account in coming to a conclusion as to whether resection or aspiration should be done.

The advantages of preliminary aspiration when it is certain that resection will be necessary are overbalanced by the loss of valuable time entailed by this procedure.

When a hemothorax is infected solely by pneumococci, a better result will probably be obtained by aspiration than by resection.

The Carrel-Dakin method applied to the treatment of septic hemothorax after resection will prove to be of the very highest importance and value, since by its means secondary infection, which is one of the chief dangers of this class of cases, can be almost completely eliminated.

For resection a light chloroform anesthesia is generally safer than, and preferable to, a local one.

Cases in which there is a gaping wound into the pleural cavity carry a very bad prognosis.

The virulence of the infection rather than the time before drainage is established determines the density of the walls of the empyema cavity and the amount of collapse of the lung in cases of septic hemothorax.

It is of great importance to get patients for whom resection has been done out of bed for a few hours at the earliest possible date, when the general condition and the pulse-rate allows.

The displacement of the mediastinum may take a considerable time to right itself, even after operation, so that care must be taken not to mistake the abnormal position of the apex beat as evidence of a dilated heart.

Bronchial breathing, râles, and an impaired resonance at the left base may be the only signs of even a large pericardial effusion.

The rarity of subdiaphragmatic abscess is somewhat surprising.

By far the commonest cause of death in cases of chest wound which reach the base is sepsis occurring in a hemothorax.

A lower mortality in infected cases is to be gained by earlier diagnosis and more efficient treatment of sepsis, rather than by early prophylactic operations undertaken as a routine.

OPERATION THE TREATMENT OF CHOICE IN PROSTATITIS.

LYDSTON (*Urologic and Cutaneous Review,* September, 1918) in a brief article writes that the thought doubtless has occurred to every urologist that there should be some way to reduce the number of permanently crippled prostates resulting from gonorrheal infection. Everybody, however, seemed to agree that once the prostate was infected it was permanently damaged—if not permanently infected. It was unnecessary to set forth the familiar anatomic and physiologic explanation of this persistency of infective prostatic pathology. What are the conditions which prevail in acute parenchymatous prostatitis? Simply infection with greater or less engorgement of the gland tissue and inflammatory exudate within a dense capsular envelope. Associated with these conditions are inflammation and a greater or less degree of encroachment upon the lumen of the prostatic ducts. As a result, micturition is frequent, painful, and often difficult. In many instances pus is present and either remains undiscovered in the form of minute foci for subsequent reinfections, or appears in the form of a definite abscess, to rupture spontaneously or be opened surgically. The author long ago expressed the view that pus formed in a large proportion of cases of acute prostatitis, the small abscesses rupturing into the prostatic urethra, the pus being mistaken for a mere recurrence of discharge. How many times we have heard: "My discharge came back yesterday, doctor, and I feel much better." For many years the author has regarded recurrent discharge in such cases as evidence of ruptured small abscess.

To the author's mind, the following indications are clear in severe acute prostatitis, viz.:

Putting the vesical neck at rest by perineal section, stretching, and drainage.

Opening the prostatic capsule on both sides, and exploring the gland with the finger. The objects accomplished are obvious: (*a*) Relief of tension with, as a corollary, relief of pain; (*b*) drainage; (*c*) evacuation of pus if present or, if it be not present, prevention of its formation.

It is evident that if operation be performed as a matter of routine in severe acute prostatitis, we seldom will have those deplorable cases of death from undetected, and therefore unoperated, prostatic abscess such as most of us have met with. The large, hard, chronically inflamed prostate, which annoys the patient during all his future life, will be a rare phenomenon in urologic practice if operation in acute prostatitis is adopted as a routine practice.

Operation in chronic prostatitis is likely to be followed by excellent results if not delayed until marked induration has occurred. Operation usually should be limited to opening the capsule and breaking

up the lateral lobes by finger exploration and pressure; this to be followed by perineal drainage. In some cases removal of sclerosed areas by morcellement is indicated.

THE TREATMENT OF SYPHILIS WITH NOVARSENOBENZOL (BILLON).

ZEISLER (*Urologic and Cutaneous Review,* September, 1918) states that in the present-day treatment of syphilis greater reliance is placed upon salvarsan and its derivatives than upon mercury. Opinions as to the relative merits of the two Ehrlich preparations, salvarsan and neosalvarsan, have varied, but the former was perhaps considered slightly more effective as a spirochetocidal remedy. Neosalvarsan was, however, preferred by many because of its greater ease of administration and lesser toxicity. During the latter years of the war reports indicated that certain lots of neosalvarsan were considerably more toxic than those previously sent over, and many practitioners abandoned the use of the German preparations.

The two principal substitutes for neosalvarsan which are on the market at the present time are neodiarsenol, the Canadian product, and novarsenobenzol "Billon," which is made in France.

For the last few months Zeisler has used the French novarsenobenzol, and, as far as he is able to judge, it is clinically and serologically equally as effective as neosalvarsan. Of forty cases which were treated with the French preparation there were five in the primary stage, six with secondary lesions, twenty late cases, including tertiary skin manifestations, cardiovascular and visceral syphilis, bone lesions and latent syphilis, eight cases of involvement of the central nervous system, and one genital case. In all cases with conspicuous symptoms the treatment was begun with four to six novarsenobenzol injections in order to test the clinical effect of the remedy, and then followed with mercury or iodides. The effect of the novarsenobenzol injections on the active symptoms of syphilis was rapid and comparable in every way to that of neosalvarsan. Chancres healed after one or two injections and secondary eruptions and gummata responded rapidly. The treatment was controlled serologically wherever possible, but sufficient time has not elapsed to permit definite conclusions as to the curative value of the remedy.

Novarsenobenzol is a safe and effective remedial agent in the treatment of syphilis in all its stages.

It is clinically and serologically equally as effective as neosalvarsan.

Concentrated solutions are to be preferred on account of the freedom from reaction and simplicity of the technique.

ARTERIORRHAPHY (BRACHIAL ARTERY): NEURORRHAPHY (MEDIAN NERVE).

CASPER (*International Journal of Surgery,* August, 1918) states that the present-day technique of vasal anastomosis without mechanical aids remains substantially the same as devised several years ago, and may be briefly described thus:

The isolation of 6 to 10 cm. of the vessel.

The application of proper clamps.

The severing of the vessel transversely with resection if required.

The removal from the vessel ends of periadventitial tissue, and also blood from between the clamps.

The placing of traction threads to evert the edges and insure contact of the endothelial surfaces; completion of the anastomosis by continuous suture from within outward through entire vessel wall.

The removal of clamps; hemorrhage through stitch holes as a rule is controlled by compression.

It will be noted that to facilitate vasal suture, the majority of operators insist upon introducing three traction threads into the severed vessel at equidistant points. By traction upon these the curved edges of the vessel are fixed and made straight—*i.e.*, an equilateral triangle instead of a circle.

Primary neurorrhaphy is the most logical

procedure in peripheral nerve injury, and should be applied in the absence of contra-indications.

Secondary neurorrhaphy may be successfully performed where primary operation seems inadvisable, and no instance of peripheral nerve injury should be considered hopeless until after the aid of surgery has been invoked.

Where the distal and proximal nerve extremities have become widely separated with formation of intervening fibrous tissue, careful dissection with approximation by the aid of mechanical devices may be successfully accomplished in a certain percentage of instances.

THE NAVAL ATTITUDE TOWARD THE VENEREAL DISEASE PROBLEM.

ELY (*Northwest Medicine,* August, 1918) in an article under this title states that it is impossible to discuss venereal disease in its broadest sense from the standpoint of military and naval services alone, as the life of the sailor and soldier must be and is influenced by the civilian community in which he happens to be.

Alert, clean-limbed, quick to learn, and versatile to a degree that is astonishing to those who discover for the first time the varied nature of his duties, to-day the enlisted man of the United States Navy is much younger than his brother of civil war times. By far the greater part of our enlisted personnel is under twenty-five years of age. When the immaturity and youth of this personnel is considered, and that many of them are absolutely ignorant of the principles of sex hygiene, with particular reference to the varieties and manifestations of venereal disease and how it is contracted, and the further fact that they have given themselves voluntarily for government service, we believe that our responsibility in this connection was tremendous and that our vigilance should be untiring. Coming from the best of homes, where they have been carefully surrounded with moral and physical safeguards, we feel that these young men are especially entrusted to our care, and that their moral and physical welfare is of the utmost importance. Parents and friends have a right to expect from this great branch of the government service, every safeguard and incentive that will protect their sons from this evil.

To bring this about it is essential that there should be a whole-time health officer in all cities and counties, who will receive a decent salary.

Coöperation with these health officers by medical men in private practice, to the end that all cases of venereal disease shall be reported by number. It is not necessary or advisable to divulge names, unless individuals resist control.

Observation and intelligent restriction of the movements of infectives, with restraint and incarceration, if necessary, of those who refuse to submit to authorized rules and regulations.

Internment of every prostitute found infected until it is demonstrated that she is no longer capable of transmitting her disease.

Prosecution, by civil authorities, of "macks" and owners of property where prostitution is permitted.

Intelligent control or abolition of the liquor traffic.

MALIGNANT DISEASE OF THE THROAT

DICKINSON (*Pennsylvania Medical Journal,* July, 1918) reviews this subject in saying that the value of surgical treatment in malignant disease of the throat is well known and needs no defense. To increase its value many times over it is only necessary to speed up the average date of diagnosis two months. A localized process in a fairly favorable location is generally amenable to surgery alone.

The same is true also of the chief non-surgical treatment, viz., radium, and the Coolidge tube, for both of which he entertains the highest regard, especially when employed as an adjunct to surgical treatment, though they are sometimes able to carry off the palm alone. The hysterical

attitude with which radium has been introduced is most regrettable but unavoidable. The lure of its intrinsic value, wonderful physical behavior and proposed uses makes it the certain spoil of the feature writer and the professional faddist, coming and going. Radium fills a large niche in therapeutics, and in the author's opinion it will ultimately fill a much larger one.

What is needed now is not new lines of treatment but a little better use of what we have. To use better what we have we must begin early. And to begin early we must get the public and the family physician to take a hopeful interest in malignant disease. A great deal more is known about it now than five years ago. Some wonderful cures have been made, and the solution of the mysterious phenomena of malignant disease will finally be found through the accumulated knowledge gained by handling a great many cases from incipiency to death or cure. If we wish to hasten this solution each and every physician should initiate a campaign of education among his patients, holding to the hopeful side and encouraging prompt examination of all abnormalities, and in the rôle of examiner his sense of responsibility should be most keen, since life is at stake.

CYSTS AND PSEUDOCYSTS OF THE PANCREAS.

KERR (*Surgery, Gynecology and Obstetrics,* July, 1918) states that in most instances the cyst growing forward presents upon the abdominal wall between the stomach and the colon, being covered by the gastrocolic omentum, which must be divided at operation. Pseudocysts are said to occupy this situation.

A cyst arising from the upper border of the pancreas may push its way between the lesser curvature of the stomach, which is pushed downward, and the liver, being covered by the gastrohepatic omentum.

The cyst, especially when it is situated in the tail of the pancreas, may grow into the mesocolon, separating its layers. If the cysts distend the upper layer of the membrane, the colon is pushed downward, and the tumor during life is found between the stomach and the colon; if the lower layer is distended, the transverse colon may be found along its upper border.

Pancreatic and pseudopancreatic cysts, while not rare, are of sufficient importance to be recorded.

The *x*-ray is an important aid in diagnosis in showing the position of the cyst in relation to the stomach and other organs.

The treatment is surgical, usually incision and drainage. Sometimes it is practiced to remove the entire cyst in favorable cases.

Diabetes is an occasional complication of pancreatic cysts, and when present renders the operation more dangerous, although one should not hesitate when less than 4 per cent of sugar is present (C. H. Mayo), after giving a diabetic diet and a course of alkaline treatment to minimize the acidosis, to give even these the benefits of operations.

An antidiabetic diet is advisable following operations on the pancreas, especially where the discharge is irritating. Paraffin ointments are serviceable to allay the irritation.

MESENTERIC VASCULAR OCCLUSION.

EISENBERG and SCHLINK (*Surgery, Gynecology and Obstetrics,* July, 1918) in concluding an article with the above title state that mesenteric vascular occlusion is not an extremely rare condition, there now being collected about 400 cases.

The occlusion is most frequently in the arteries.

By far the most common lesion produced is hemorrhagic infarction of the intestine.

The most common cause of the occlusion is embolism resulting from infection and injury.

There is no difference clinically between the arterial and the venous occlusion, regardless as to whether it is due to embolism or thrombosis, in the superior or the inferior vessels.

The clinical diagnosis should be made on sudden onset, acute colic-like abdominal pain, distention and tenderness, signs of

shock and collapse; often there may be vomiting and constipation; if diarrhea is present, it is almost always accompanied by melena.

A few cases in which a diagnosis of mesenteric thrombosis was made have recovered under the expectant treatment, but in those cases the diagnosis obviously may be questioned. At best the treatment has been unsatisfactory, but the prevalent opinion among most observers appears to be that the sooner operative measures are undertaken the better the prognosis. In those cases in which all or most of the intestines are gangrenous it is obvious nothing surgically can be done. In this connection Zesas quotes experiments on animals and concludes that in man at least two-thirds of the intestine must be left behind in order to obviate the possibility of death from inanition. If, however, only a small segment of intestine is involved any method of resection and subsequent anastomosis which can be done most rapidly affords the patient the best chances of recovery. In more extensive destruction of intestine and peritonitis drainage must be used.

KINEPLASTIC AMPUTATIONS.

Putti (*Lancet*, No. 4945, Volume CXCIV) states that the possibility of being able to utilize the functional resources of the stump so as to convey movement to the artificial limb was an idea that first came to Dr. Vanghetti in 1896, at the time of Italy's second expedition into Abyssinia, when those of the Allies' soldiers who had been taken prisoners by the native forces under the Negus were cruelly tortured and mutilated.

Dr. Vanghetti has given the name of kinematic plastics, or kineplastics, to any kind of bloodless or operative plastics that tends to economize, restore, or substitute muscular masses which can be employed toward imparting direct and voluntary movement to an artificial limb.

The word kinematization was formerly used to indicate the kineplastic operation: it was subsequently applied to every kind of kinematic artificial limb, and, finally, to the active and precocious mobilization of such muscles as are involved in kineplastic operation.

Every moving entity obtained kineplastically, whether bloodlessly or operatively, is called plastic-motor (motor flap).

These motor flaps are based on the following general principles: In an actual, or antecedent, amputation or disarticulation, the tendon and muscle, provided they have the necessary physiological protection (skin, vessels, nerves, etc.), can generally be used for the kinematic prosthesis, provided that they admit of the formation of an artificial point of attachment, to be protected in a similar manner. Kinematization can be effected, or prepared for, at the time that the primary amputation is made; it can also be done on stumps that have already healed.

Up to the present, as regards their shape, the most elementary, and the most commonly used, are the clava and ansa motors, and also those obtained by means of the canalizing, or tunnelizing, of the muscular masses.

As regards the number, the motor can be single, double, or multiple; in function it can be either unimotor or plurimotor. When the motor is made to execute two opposite movements in succession one to the other it is called alternative. According to the position they occupy motors are either terminal, when placed at the extremity of the stump, or extra-terminal should they be placed in the continuity of the stump.

Up to the present the upper limb has been the part that has been the most frequently kinematized, but the number of successful cases of kinetization of the lower limbs is daily increasing.

It is evident that the application of kinetization must entail a radical upheaval of all preconceived notions regarding the ordinary methods of amputation.

In cases in which it is practically impossible to perform primary kineplastic operations, as, for instance, at the first-aid dressing stations in the full stress of battle, the surgeon can, at any rate, always so

operate as to prepare the ground for a future kinematization of the stump.

Skin flaps, muscular insertions, various bone and tendinous fragments and segments of limbs, which would seem utterly superfluous under ordinary circumstances for the preparation of ordinary stumps, are to be considered of the greatest value in view of the future kineplastics.

In order to prevent the possible loss of these elements and of these materials whilst the stump is undergoing the process of healing, it is best to take certain special technical precautions to avoid the retraction of the softer tissues; this ought to be done, however, in such a way as not to hinder the ordinary dressing of the wound.

When the inflammation has decreased, and further complications are no longer to be feared, the time has come when the actual kinematization may be proceeded with—that is to say, the preparation of the motor flap.

A motor flap, in order to correspond with the object for which it is made, must conform to the following requirements:

It must possess every requisite for withstanding a firm, resisting, and painless grip, also a traction that, in not a few intances, may attain a high degree.

It must be provided with a sufficient amount of functional muscular tissue to guarantee the accomplishment of the task that will be demanded of it.

Now the primary conditions for obtaining the first requisites are:

That the motors be covered with skin in perfect condition well nourished, and provided with a normal degree of sensibility.

That, with regard to its shape and dimensions, the motor be of a size suitable for the fastening of the hooks, wings, and rods that are destined to transmit the functional movement to the artificial limb.

The muscular masses must be sought for and obtained from amongst those of which the stump still disposes, and that, on account of their anatomical structure and physiological disposition for the production of broad, strong, and independent contractions, are best adapted to the task.

In the choice and distribution of these the fundamental principles of the physiology of movement must be thoroughly observed and respected.

As the tendon is the element best adapted for the transmission of muscular contractions, it must be largely employed for the formation of motor flaps.

Should the tendon be missing the muscles must be utilized by including muscular masses in order to obtain extra-terminal motors.

The antagonistic powers, indispensable to all active movement, must be provided either from the stump itself, by the formation of motors with elements belonging to muscular groups of opposite action, or from the artificial limb by means of elastic resistance offered by the motor flap.

With a view to gaining both space and integuments it may be advantageous, at times, to shorten slightly the bony stump and to perform excision of superfluous muscular masses; this, however, depends upon the bone being sufficiently long to allow it.

In order to provide such materials as may be missing *in loco* recourse may be had to the numerous methods that modern plastic surgery places at our disposal, as, for instance, skin, muscular, aponeurotic, or osseous transplantations, etc.

The kinematization of the thigh stump enables us to solve one of the most difficult prosthetic problems—that of gaining active power over the knee-joint. With the ordinary artificial limbs the knee extension is obtained either by means of springs or of elastics, absolutely independently of the will of the patient, or else through tensors which he directs by means of auxiliary movements of the trunk and shoulder.

With regard to the difficult problem of utilizing short forearm or short leg stumps, the solution will be enormously facilitated through the preparation of points of attachment that correspond to the insertion of the biceps and patella tendons.

The practical results that have been obtained through kinematization have assured the author that the hopes placed in the

principles and methods of the modern theory of motor flaps, classed amongst the most brilliant of the discoveries of orthopedic surgery, deserve to be accepted with perfect confidence, and to be tested on a large scale by all those whose aim it is to restore to the disabled man his functional activity.

The preparation of motor flaps is a well-defined surgical act that must be performed in accordance with its own special technique, the methods of which have already stood the test of experience.

From a physiological point of view motor flaps are actually capable of giving both the quality and quantity of action determined by the muscular masses that actuate them. Yet, practically considered, motor flaps will be able to yield the full measure of their value only if the artificial limb is perfectly adapted to their shape and their strength.

As the principal aim is to attain the vitalization of the artificial limb, it is essential that the surgeon and the mechanic should work in harmony in order to solve satisfactorily this most interesting, if difficult, problem.

SURGERY OF FAUCIAL TONSIL.

SCHULTZ (*Medical Fortnightly*, Aug. 15, 1918) states that so much has been written and spoken in recent years concerning the surgery of the faucial tonsils and its indications, and the apparent necessity for its employment, that one might be led to think that the subject has been entirely exhausted and that nothing further remains to be said. At this time, happily, a new era of vital regard and conservative consideration for the tonsil has set in, which prime objective seeks to thwart or set aright the desultory and pernicious practice of the old, and promise to spare the member against unnecessary loss and indiscriminate destruction. Surgical intervention has its proper and useful sphere, here as elsewhere, but its indiscriminate employment without therapeutic aim will not be tolerated long. The same may be connoted with regard to procedures or operative methods for removal of the tonsils which have been introduced from time to time and advocated by their exponents to meet every requirement of a universally suited procedure—suited to all cases regardless of situation or circumstance. No one technique is so perfect in its application and adaptability as to reach the multiplicity of morbid surroundings and variant requirements of every case. The writer may be taken to task for this assertion, but he will, nevertheless, hold firmly to the view.

In reviewing superficially the history of tonsil surgery, one may be surprised to encounter periods of definite trends and movements, and to find that a large number of physicians were caught up in the special waves of progress—that is to say, that many operators adopted one or another procedure or instrument as their favorite to the exclusion of all others.

The author has resort to the three methods—dissection, snare, and the guillotine. In the author's opinion, adult tonsils, hard, infected, submerged, and bound down by strong adhesions and impossible to be enucleated with the tonsils snare, are best suited for dissection with the use of a local anesthetic. The ideal tonsil for dissection is the tonsil of the young person, without firm adhesions and large enough to be readily taken hold of. Such a tonsil can be removed with the capsule without much difficulty. The objection to the use of the tonsillotome is the danger and great likelihood of severe hemorrhage during the operation or a short time afterward, and the difficulty, by this method, of securing the entire tonsil. One advantage is that the instrument produces the least traumatism, while the Sluder guillotine produces the most. An infected tonsil should be removed in its entirety. In peritonsillar abscess or quinsy the capsule should come away with the gland in order to prevent subsequent trouble in that area.

The ideal tonsil for the plain snare is one of the old or young which is free from large, firm adhesions. This condition will not offer any obstacle to the expert with

the snare. Where adhesions alone exist, they may be broken down with the knife or scissors, or with almost any suitable instrument, and converted into a simple snare proposition.

The guillotine with the dull blade, in the writer's observation, offers many disadvantages. It is best fitted to young tonsils, with or without adhesions or synechia of the pillars. No dissections or freeing of the structures is done when the guillotine is engaged. To employ the guillotine, to be brief, the ring of the instrument is placed over or around the tonsil and lifted against the eminence of bone behind the roots of the third molar tooth. If necessary, the forefinger of the free hand is placed against the upper pole of the tonsil and pushed through the ring above; then with great strength the ring is further driven against the body of the lower jaw-bone until it completely encircles the capsule; the blade is then pressed down tight and locked. Some guillotines are provided with a screw attachment to the blade which drives the blade tighter and severs the tonsil.

With the original Sluder guillotine having the blunt blade, after the blade is fastened around the capsule, the practice was to wrench the tonsil away from its attachment to the superior constrictor muscle. This necessarily excited a large degree of traumatism in this region and oftentimes lacerated the posterior pillar and tore the muscles from their normal attachments. If the wrenching force could be done away with the operation would be highly commendable in many instances where it is not so well suited now. Operators who use the guillotine exclusively do very good work with it because the operator controls the entire work in the mouth, including the labor of holding the patient's tongue down and out of the way.

REVIEWS.

A Text-book of Practical Therapeutics. With Especial Reference to the Application of Remedial Measures to Disease and Their Employment upon a Rational Basis. By Hobart Amory Hare, M.D., B.Sc. Seventeenth edition, thoroughly revised and largely rewritten. Illustrated with 145 engravings and six plates. Lea & Febiger, Philadelphia, 1918.

Under the circumstances it would seem that in place of a review or notice of the appearance of the seventeenth edition of this book, it is best to quote its Preface:

"The preparation of the seventeenth edition of a book requires more care and judgment than the writing of the first, if the author desires to have it represent things as they are and not as they have been. He must hold fast to that which is good and cast aside that which has become obsolete, but in doing this he must not permit his desire to accept the new to overcome respect for the old, if the old has the endorsement of long experience on the part of his fellows and himself. At the present time scientific investigation has all the enthusiasm of youth and little of the judgment of age, and its devotees, who speedily win for themselves the honor which is due the original investigator, are prone to reach dogmatic conclusions and without hesitation assert that views heretofore accepted are fallacious. Those who carefully follow medical literature know full well that very frequently the laboratory investigator is shown to be as liable to fallacy as the bedside student. All too frequently impelled by the enthusiasm which has produced a research, the clinician embraces the results as gospel truth and is disappointed in his subsequent experience and at finding that other investigators soon prove the first in error. Apt illustrations of these statements are seen in Ehrlich's early view that one large dose of salvarsan would cure syphilis, in the failure of Wright's hope that by the use of calcium

salts we could increase the coagulability of the blood, and the increasing evidence that vaccine therapy, while useful, has a limited range of value.

"The original investigator is like a prospector who, going over new or old fields, brings back to the assayer nuggets which often prove of great value, but many times prove of little or no value, and it is the duty of the author of a book of this nature to be an assayer and not to consider that new substances are always better than old ones or that old ones have been overvalued. The bedside student of therapeutics should read and study the results of investigators, and the investigators should be slow in showing disrespect for his long-established conclusions. In this edition the author has endeavored to place before his students and readers facts from the laboratory and clinic in proper balance. It must be recalled that practical therapeutics will always be ahead of experimental therapeutics because thousands are practicing the former and dealing with conditions of disease and a mere handful are working in the laboratory and using healthy men and animals in their studies. The last thirty years have done much to put hitherto empirical methods upon a scientific basis, to develop new plans of treatment, and in the repeated revisions of this book the author has tried to include most of them.

"The great war has greatly increased our knowledge concerning shock, emphasized the need of proper methods of intravenous injection or of direct transfusion, and, therefore, greater consideration of the technique of these procedures is included than before. The use of Dakin's fluid by Carrel's methods and dichloramine-T and the treatment of burns by paraffin are discussed for the first time. The methods of prescribing a proper diet for the sick are described more in detail than formerly, particularly in respect to children and diabetics. Many important drugs heretofore made in Germany, or under German patents, are now made in this country and have been given names whereby they may be properly designated, as, for example, arsphenamine for salvarsan, and procaine for novocaine, and these changes have been included in the following pages.

"The present edition has required so many alterations and additions that a large part of it has been reset in new type."

SURGICAL TREATMENT. By James Peter Warbasse, M.D., F.A.C.S. A Practical Treatise on the Therapy of Surgical Diseases. For the Use of Practitioners and Students of Surgery. In three volumes, with 2400 illustrations. Volume I. Philadelphia and London: W. B. Saunders Co., 1918.

The author states in his preface that this work has been written in the interest of the surgical patient, his aim being to make information which would be helpful to the surgeon easily accessible and its application practical. There is a certain originality in the classifications, as indicated by the heading "General Principles," under which we find the subheads "Ancestral and Personal Peculiarities," "Nourishment," "Fresh Air," and "Nursing." Sound common sense is shown by the advice that sickness in the aged is a dangerous time to attempt the inauguration of reforms.

On page 24 is found an excellent picture of a bed-pan of the early Victorian type. Asepsis and antisepsis are familiar titles and are briefly discussed. Surgical materials with preparation and sterilization are given a much more minute consideration, as are anesthesia and anesthetics. Thereafter follow sections on wounds and infections, among the latter being classed syphilis, with a brief description.

Tumors are very briefly disposed of. Not so the Surgery of the Blood and Blood Vessels, to which many pages of the book are devoted. A striking illustration is one showing hypodermoclysis beneath the breast, transfusion from the radial artery of an adult donor to the femoral vein of a baby, and girdle constriction of the aorta, the so-called Momburg constriction.

Perchance the fracture section is written with less cheerful enthusiasm than is shown in the rest of the book.

Dislocations are treated in the usual

fashion. About 100 pages are devoted to operations on the bones and joints. Under the section devoted to the spine and its appendages there is found a satisfactory picture of a comedo extractor.

For the removal of tattoo marks, treatment, after cleansing, with a 75-per-cent solution of zinc chloride is advised. The skin is moistened with this solution and allowed to dry. A crust forms, which drops off in about two weeks, leaving a slight scar. Many methods of suturing nerves are illustrated, some of which are no longer popular.

The student who goes carefully over this book will find in its pages much to instruct, at times something quite new and as a rule thoroughly sound and conservative surgical treatment. That it does not differ widely from other text-books dealing with similar topics is to its credit rather than the reverse.

THE ANATOMY OF THE HUMAN BODY. By Henry Gray, F.R.S. Twentieth Edition, thoroughly revised and reëdited by Warren H. Lewis, B.S., M.D. Copiously illustrated. Lea & Febiger, Philadelphia, 1918. Price $7.50.

Text-books of human anatomy have appeared without number during the last fifty years, but not one of them has succeeded in maintaining a first-class position, at least to the extent which has been held by this book, from which it may be safely stated that the vast majority of living medical men have learned their anatomy, so far as it is possible to gain a knowledge of this subject from a book, from this work.

The editor of the present edition is the Professor of Physiological Anatomy in Johns Hopkins University.

During the years of the existence of "Gray" the changes which have taken place in our knowledge of the human body have been very great, especially in connection with microscopical anatomy and the anatomy of the embryo.

In the present edition new matter on physiological anatomy, the laws of bone architecture, the mechanics and variations of muscles have been added, occupying much of the space formerly devoted to the section on applied anatomy. So, too, the sections upon the ductless glands and the nervous system have been largely rewritten and as rational a presentation of the sympathetic nervous system has been presented as our present knowledge makes possible.

Altogether there are no less than 1247 engravings in this issue.

Considering the extraordinary hold which this book has had upon the profession it is interesting to note, as the editor points out, that although Henry Gray saw only the first edition, much of the original text persists and many of his illustrations are still in use.

We doubt not that Gray's Anatomy, "descriptive and surgical," as it used to be called, now that it has been so skilfully reëdited, will maintain its popularity.

GYMNASTIC TREATMENT FOR JOINT AND MUSCLE DISABILITIES. By H. E. Deane, R.A.M.C. With a preface by Colonel A. Carless and one by F. W. Mott, F.R.S., R.A.M.C. Oxford University Press, London and New York, 1918. Price $2.50.

We are told in the preface by Colonel Carless that during the last three and a half years he has been engaged almost constantly in attending sick and wounded soldiers in various spheres of duty. For this reason he is very much interested in the little book for which he has provided a foreword.

He well points out that the ordinary medical man who orders massage for a patient knows nothing from personal experience of the methods employed or of the results obtained or obtainable. He hands the patient over to the massage department with a smug satisfaction that he has done his duty, and the massage is carried out by a woman who knows nothing but massage and perhaps a little electricity, with the result that she will continue her massaging most assiduously and devotedly until all hope of gaining improvement thereby has long since ceased.

He also emphasizes the importance of getting good results through the efforts of the patient himself, and deals wisely with the matter of employing expensive machines to restore mobility to stiff limbs.

This is the whole point of the volume, namely, that at the Croyden General Hospital, Colonel Deane has proved that it is possible to do a great deal without a great amount of expensive paraphernalia.

Mott, who contributes the second preface, writes in an equally sensible and practical way.

The text of the book by the author himself covers 120 pages, and a considerable number of illustrations are included to show the various movements which the author has found advantageous for the purpose of reëstablishing functional efficiency of muscles and joints. It is a first-rate little working manual printed in large type and prepared by one who knows how to produce results with a maximum of efficiency and a minimum of extraneous aid.

THE COLLECTED PAPERS OF THE MAYO CLINIC, Rochester, Minnesota. Edited by Mrs. M. H. Mellish. Volume IX, 1917. Philadelphia and London: W. B. Saunders Company, 1918.

This book, the most valuable contribution of the year, contains articles by Balfour, Braasch, Carman, Graham, Henderson, Judd, Kendall, McCarty, the Mayos (C. H. and W. J.), Rosenow, Sistrunk, Stokes, Wilson, and others.

The first article, an excellent one, by New on "Harelip and Cleft Palate," explains on anatomical grounds the reasons for the many failures in this operation. Graham contributes a characteristic, sound paper on "Peptic Ulcer and Gall-stones" in upper abdominal diagnosis, placing great confidence in the interpretation of the *x*-ray. Balfour gives a brief and lucid description of his operation for gastroduodenostomy; also his method of restoration of gastrointestinal continuity by means of anticolic jejunostomy.

The papers of W. J. and C. H. Mayo are characterized, as always, by their singular clarity and that aptitude for large conclusions which comes from the careful study and logical analysis of a huge experience. Judd states in his contribution on the surgical treatment of the prostate that he is convinced that his patient's general resistance to infection has been increased by vaccine. The patients are given vaccine every three days during their preoperative and postoperative treatment, starting with 50,000,000 bacilli and increasing to 500,000,000 bacilli maximum dose. By comparison with an equal number of cases, he notes that there were eleven complications in the non-vaccinated patients, to three in the vaccinated. In this volume is found Kendall's classical paper on Thyroid Hormone, with much experimental work which has its clinical bearing; "Studies of the Auricular Flutter," by Blackford Willis; "The Factors of Coagulation in the Blood in Certain Pathologic Conditions," by Pettibone; "The Selection of the Donor for Transfusion," by Sanford; "Hæmolytic Jaundice," by Gifford; "The Wassermann Test in Clinical Diagnosis of Syphilis," by Stokes; "Methods of Intravenous Injection," by the same author; "The Treatment of Epidemic Poliomyelitis with Immune Horse Serum," by Rosenow; a review of the literature of "Etiology and Pathology of the Trench Foot," by L. T. Wilson; "A Contribution on Shock During General Anæsthesia."

These and many other papers, particularly those by the Mayos and Balfours, give this volume a value which even surpasses its predecessors. It is a necessary addition to the library of both the modern physician and surgeon.

DISEASES OF THE MALE URETHRA, INCLUDING IMPOTENCE AND STERILITY. By Irvin S. Koll, B.S., M.D., F.A.C.S. Illustrated. Philadelphia and London: W. B. Saunders Company, 1918.

The distinguished author of this work has been led to put in print his conception of the subjects covered because he has long felt the need of a comprehensive monograph. He has concentrated on conciseness, clearness, and simplicity, and has embodied into the text his research on the biologic chemistry of the gonococcus and his studies on spermatogenesis.

The first chapter is devoted to anatomy and makes no large departure from that

commonly set forth in similar books. Under the caption "History of Gonorrhea" he states that our story begins at the fifteenth chapter of the Book of Leviticus.

As to treatment, the injection of an albargin 1-per-cent ointment is preferred. The statement is made that 60 per cent of patients seen within twenty-four hours after the discharge has begun can be cured within five to ten days. The patient is advised to go to bed from forty-eight to seventy-two hours. Fifteen to twenty-five glasses of water should be drunk each twenty-four hours and urethral instillations of albargin should be begun at once; the urethra being well distended and each injection being retained fifteen minutes. After the instillation has been allowed to escape, a tooth-pick applicator is saturated with albargin and inserted into the meatus as far down as the corona, where it is allowed to remain fifteen minutes longer. Some patients do not tolerate this injection. In them protargol is used, ½- to 1-per-cent strength.

The burning during micturition is best relieved by sodium bicarbonate in teaspoonful doses, two or three times daily.

There is a chapter on complications; a very complete section upon stricture, with discussion of non-gonorrheal urethritis; and a study of sexual impotence and sterility. This is an excellent work, embodying a large clinical experience, put up in concise form.

GYNECOLOGY. By William P. Graves, M.D., A.B., F.A.C.S. Second Edition, Thoroughly Revised. Philadelphia and London: W. B. Saunders Co., 1918.

This comprehensive work is classified in accordance with accepted methods. The first part is devoted to physiology in relation to gynecology and the general organism; the second part to the gynecologic diseases; and the third part to operative gynecology. An ingenious and thoroughly logical subject arrangement makes reference to any desired topic extremely easy.

There is scattered through the book much information bearing upon the subject at large; thus it is noted that Legrand du Seulle found that out of fifty-six women detected in theft at shops in Paris, thirty-five were menstruating; and, on the authority of Krugelstein, it is stated that of 107 cases of suicide in women, the act was committed in all during that perod.

The author has freely accepted Freud's doctrines bearing upon sexual instinct and its effect upon women. He has contributed an interesting paper on enteroptosis.

The section on Gynecologic Diseases follows the recognized standard form. There is a brief but excellent section on symptomatology in gynecology.

The part devoted to operative technique is admirable in writing and illustration.

A book of great value, clear and succinct in its style; modern, yet conservative in its treatment. An excellent and safe guide for the student and practitioner.

THE ORTHOPÆDIC TREATMENT OF GUNSHOT INJURIES. By Leo Mayer, A.M., M.D. Illustrated. Philadelphia and London: W. B. Saunders Company, 1918.

This book, most gracefully introduced by Brackett's foreword, is not intended as a treatise on Orthopedic Surgery, but merely to emphasize certain rules for guidance in the treatment of war injuries. These are considered under two main groups—*i.e.*, those of the front and those of the base hospital. In the field, the essential problem is proper fixation of the injured part; in the base hospital the proper time to discontinue fixation and restore motion.

One chapter of the book is devoted to artificial limbs; one chapter to the organization of Reconstruction Hospitals.

In the general subject at the front (that is, the major heading) he considers injuries to joints, to nerves, to muscles and cutaneous tissues, and transportation of wounded. Part second is again devoted to the same subject.

The author does not discuss cleanliness, but plunges at once into the subject of fixation, which must prevent shortening and hold the fragments properly, which

must allow of massage, and which must permit of access to wounds.

His illustrations are excellent; his text clear; therapeutics sound; and his teaching that followed by most surgeons.

PROGRESSIVE MEDICINE. A Quarterly Digest of Advances, Discoveries and Improvements in the Medical and Surgical Sciences. Edited by H. A. Hare, M.D., assisted by L. F. Appleman, M.D. Volume III, September, 1918. Lea & Febiger, Philadelphia, 1918.

This issue of Progressive Medicine, as in the September issues of previous years, contains articles upon Diseases of the Thorax and its Viscera, including the heart, lungs and blood-vessels, by Dr. William Ewart of London; Dermatology and Syphilis, by Dr. W. S. Gottheil of New York; Obstetrics, by Dr. Edward P. Davis of Philadelphia; and Diseases of the Nervous System, by Dr. William G. Spiller of Philadelphia.

It will be recalled that the design of Progressive Medicine is to present a story of the subjects discussed during the preceding twelve months. The authors of these articles are authorities in their individual lines, and having contributed these articles in previous years know exactly what material is needed to make their contribution interesting and of practical value.

HYGIENE OF THE EYE. By William Campbell Posey, A.B., M.D. Illustrated. J. B. Lippincott & Co., Philadelphia, 1918.

The exact scope of this book is not very well described in its title, for it not only deals with the various strains and common diseases which affect the eye, but also with the ocular injuries received by workmen in foundries, factories, and elsewhere. It also considers the proper illumination and equipment for the schoolroom.

Four of the chapters have been contributed by distinguished specialists on the subject which they discuss, but neither the title-page, the preface, nor the table of contents reveals who these specialists are.

Considering that the illustrations are not in colors, they represent remarkably well the pathological conditions which they are designed to show. Of course there is a colored plate showing the fundus of the eye and its appearance in different normal individuals as well as in those who are diseased.

The book is printed in an unusually large type and is definitely designed for the physician rather than for the laity, since operations are described. If the layman who has charge of workmen and children is willing to leave that portion of the book which is definitely technical and peruse those chapters which are particularly interesting to him because of his occupation he will gain much valuable information.

Dr. Posey has been known for a number of years as one who is particularly interested in the subject of which he writes, and as Ophthalmic Surgeon to the Wills Eye Hospital and Chairman of the Commission on Conservation of Vision in Pennsylvania he has had opportunities to become thoroughly familiar with his theme.

MEDICAL RECORD VISITING LIST FOR 1919. Revised. William Wood & Co., New York, 1918.

This well-known Visiting List, intended for the physician's pocket, has appeared for so many years that many of our readers must be very familiar with it. It comes in several forms. Thus, there is one form for 30 patients a week, costing $1.50; another for 60 patients a week for $1.65; and one for 90 patients a week, $2.25.

The List contains the preliminary matter which is common to such publications, as well as approximate equivalents, weights and measures, doses, an obstetric table or chart, and hints with which to meet emergencies.

The appearance of the List, both as to its binding and paper, is up to the standard which it has always heretofore adhered to.